

WESTERN INDUSTRY

VOLUME VII NO. 3



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March, 1942

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WESTERN INDUSTRY

The Journal of Western Development

JUST A Rough Idea

Power

The capacity of both Bonneville and Grand Coulee government power projects will be doubled in the not distant future. According to plan, work to this end is already under way. Last month Secretary of the Interior Harold L. Ickes was given an opportunity to air his views for further northwest development, dwarfing anything hitherto dreamed. See page 7. From Washington, Arnold Kruckman, staff writer, again warns that business must convert to war work—or else. Some interesting conversion examples are given. See page 8.

Plant Safety

You will want to read R. P. Blake's formula for determining if your plant safety record is good, bad, or just average. Nationally known writer on plant personnel safety subjects, Mr. Blake's article provides a gauge for smaller plant operators whose business does not justify employment of full-time safety engineers. See page 10.

China

The Pacific West will logically take a leading part in the rehabilitation of China, on the premise that we will win the war. Transportation—roads, roadbuilding equipment and automobiles will be needed. Dr. Fong, expert on Chinese affairs, tells what is going on across the Pacific. See page 12. Western beet sugar producers, restricted in the past, may get a better break as a result of the curtailment of supplies from other sources. See page 16.

Industry Trends

A new department which will appear regularly each month. No matter what line of business you are interested in, these pointers and industry trends tell what the other fellow is doing—his problems and how he is helping to solve them. For instance: tungsten is scarce. Some substitutes are suggested by the American Silver Products Research Project. See page 18.

Mr. Ickes Goes to Town

Business Must Convert

Accident Prevention

By R. P. BLAKE

Chinese Picture

By DR. H. D. FONG

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Western Sugar Bowl

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President Franklin D. Roosevelt to Congress, January 6, 1942

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LOS ANGELES

Louis F. Holtzman, *Editor*
Arnold Kruckman, *Associate Editor*

Danger Ahead

IN A busy world, immersed in the task of watching the progress of our war effort, the two line dispatch from Washington last week printed in the public press that the House Ways and Means Committee by a vote of 16 to 8, had killed H.R. 6559 perhaps conveyed little to many of us. The bill was important to practically all of us—employers and employees alike who have contributed regularly to the Social Security funds now administered by the states. Loss of state rights to enact and administer their unemployment systems would have resulted from passage of the bill. The aggregate $2\frac{1}{2}$ billion of reserves would have been merged with a proposed \$300,000,000 federal appropriation under this "Temporary War Displacement Act" to lessen "the hardships of unemployment incident to conversion of non-defense plants to defense plants." The general idea was to provide benefits and use these funds to train workers for new jobs. It would have meant the federalization of state unemployment programs. Another step taking away state rights under the guise of war necessity.

Legislation Will Be Revived

THE Temporary War Displacement Act in plain words was one of the most drastic pieces of legislation proposed since the war started. The measure replaced H.R. 6465 which was also killed. President Roosevelt was solidly behind the bill with a special message last January. Arguments for passage of this bill were predicated on the old bug-a-boo—FEAR. Fear that states' funds were inadequate—fear that the states could not be depended upon to do their job—then the statement that the $2\frac{1}{2}$ billion reserves had been accumulated "because of small benefit payments." The refusal to bring the bill out of committee was a major slap at the Administration. Much credit must be given to civic service organizations which raised a storm of protest to Washington of such proportions that a pliant house committee could not accede. The matter is not a dead issue. More legislation will probably be introduced under some other label.

Our Labor Leaders

DESPITE the emergencies of war, our labor leaders continue to keep their names in print, showing no hesitancy in leading strikes affecting plants doing 100 per cent war work. Last month on the Pacific Coast, we had the Welders' Union strike involving a jurisdictional dispute with AFL over their status. The strike is dying a slow death because of unpopularity even among workers who assaulted picketers in Seattle.

Here in San Francisco we have an outstanding example of pig-headed labor leadership which puts self-interest ahead of workers' welfare. A six month old department store strike was settled last month by agreement to resort to negotiation on the question of wages. Demands for a closed shop went unrecognized. We still have with us the seven-month old hotel workers' strike. During this period the labor leaders have put demands for a closed shop ahead of pay increases, depriving workers of

higher wages offered in a futile attempt to establish a labor monopoly within the hotel industry. Which is more important—higher pay or the closed shop?

Mr. Ickes Proposes

MR. ICKES last month made some important recommendations—an expansion program of mineral and power development scaled to meet war's demands. It would affect chiefly the western states. Work is already planned and under way for doubling the output of the huge Bonneville and Grand Coulee dams. Ten new major power developments are proposed for the western states to cost over half a billion dollars. Mining and ore reduction plants are proposed. How will all this power be used? To supply the demands of a huge base metals industry! It is a proposal for TVA in another form—a huge western version for government entry into all types of business, if it so wills. The report available at the Department of the Interior is worth study.

Looking Ahead

IT WAS estimated that at the close of 1941, there were 5,000,000 persons engaged in the war industries; 2,100,000 in the military services; 3,900,000 unemployed; and 44,000,000 engaged in civilian pursuits, including agriculture.

By the end of 1942, it is expected that there will be 18,000,000 engaged in war industries; 5,000,000 in military services; 2,000,000 unemployed, and 32,000,000 in civilian efforts.

And by the end of 1943, expectations are that 25,000,000 people will be helping to turn out the sinews of war and 10,000,000 men will be using these products in the military service; 1,000,000 or less will be unemployed (commonly referred to as the "hard core"); and 24,000,000 will be engaged in civilian pursuits.

In other words, the total will jump from 55,000,000, close of 1941, to 60,000,000 at the close of 1943—specifically a shift of about 8,000,000 to the military branch of our government and 20,000,000 to the war industries. From whence are they coming? These soldiers, sailors, the shipbuilder and the aircraft worker, the munition worker?

Where are the department stores going to get their sales clerks? Where will the owner of the small shop get that lathe operator?—a welder?—or bench hand?

Right now it is practically impossible to find a journeyman mechanic available for non-defense employment.

DEMOCRACY

The only democracy worth fighting to get, to keep or to regain is: Democracy which frees the individual to speak or write; to work or worship, to conduct all of his affairs with due regard for the rights and privileges of others. That democracy is a product of action. It never has been talked into existence or rescued by words. It only can be perpetuated by continual effort.

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MR. ICKES GOES TO TOWN

Senate Sub-committee Report on Natural Resources Provides the Peg from Which Are Aired Proposals for Huge Power and Metals Development Program; New Powers Wanted by Interior Dept.

WHEN Senator Joseph C. O'Mahoney (D. Wyo.), following his appointment as chairman of a Senate sub-committee of the Committee on Public Lands and Surveys three months ago, presented his 31-page preliminary report recommending development of the mineral resources of public lands, no doubt he had the satisfaction of a job well done. Particular attention was given to western projects.

There will be no necessity for any further reports from Senator O'Mahoney's sub-committee. Last month, Secretary of the Interior Harold L. Ickes stepped out of his role as petroleum coordinator, backed into the Interior Department and stole the show. He laid before the Senate his proposed expansion of mineral and power development covering 25 states and Alaska.

The report was designated as in response to an inquiry from Senator O'Mahoney's committee. It furnished an excellent peg upon which Secretary Ickes aired his ideas, some old—many of them new, which would give the federal government a monopoly of power development in the Pacific

Northwest. Tennessee Valley Authority for the Northwest but by another name.

While 25 states and Alaska are touched upon in the report, most of it is devoted to power and mineral development in the west. Secretary Ickes sets a fast pace for power development in the west. His reports dwarf anything ever projected at any time for the northwest, Ickes' conceived plans included. Ten major power projects presented, call for an expenditure of half a billion. Recommended is federal exploratory work, mining operations and erection of mills and metal reduction plants. Here also the west takes the important role.

The report is too voluminous for detailed analysis here. As it affects the west, it recommends government metal and power development throughout the 11 western states. For instance, a power project is recommended for Bridge Canyon on the Colorado River with a 600,000 KW. capacity to cost \$173 million. And so it goes.

There are two phases to the huge power development proposed for the Pacific north-

west—immediate and distant. For the immediate future is proposed:

Completion of the Bonneville power project with the addition of five 54,000 KW. generators to the five now operating. Work is already under way here, part of previous plans.

Installation of six left-bank power house 108,000 KW. generators at Grand Coulee on the Columbia River; three right-bank generators of equal capacity augmenting the two now operating and another which will go into operation about April 1.

Raising Seattle's municipal Ross Dam on the Skagit River to increase capacity to 79,000 KW. without additional generators and acquisition of the Rock Island Dam owned by the Puget Sound Power & Light Co. of Seattle.

Ten other power development items in the northwest program combined have an estimated cost of \$485 million to produce an additional 3,500,000 KW. of generating capacity. The Bureau of Reclamation-Bonneville Power Administration power output of 1941 is to be tripled. Proposed is development of power at: Umatilla, Priest Rapids, and Foster Creek, on the Columbia River; Detroit, Ore.; Pend Oreille Lake, Idaho; Cabinet Gorge and Clark Fork, Columbia River, Wash.; Pasco and Nez Perce on the Snake River, Wash.; and Hungry Horse on the Flathead River, Mont.

(Continued on page 26)

• Secretary Ickes wants more of these projects in the Northwest, all part of a vast program recommended by him for a government operated mineral and power project covering 25 states and Alaska. Ten projects are listed for the Northwest to cost \$485 million. Shown here is the Grand Coulee dam on the Columbia river where the second 108,000-kilowatt hydroelectric generator will go into operation about April 1. Six more such units under construction when installed will bring Grand Coulee development to the halfway stage with 1,944,000 kw capacity.



BUSINESS MUST CONVERT

Transition to War Production for Practically All Plants Is Chief Topic of Discussion of Official Washington; Changeovers Already Made Pattern Modern Industrial Fairy Tale in Their Diversity

By ARNOLD KRUCKMAN
Associate Editor

WASHINGTON, D.C.—Conversion is the chief, almost main topic, of Donald Nelson's public talks. He urges it is necessary to convert *small* as well as *large business* to war work if we do not want to be defeated. He frankly says the proportion of the 184,000 small business plants thus far converted is so insignificant that he has not even bothered to get an exact figure.



WPB recently gathered information about a number of representative examples of conversion for its own private information. The list is not inclusive, but it undoubtedly gives a

graphic picture that might fairly be regarded as an index of the whole small business conversion situation. It tells the story in regard to geography and in regard to the type of plant that has been converted from the manufacture of one product to another; the other, naturally, being something needed for the war. Unfortunately it is not permitted to give the name of each plant, nor its location. The list numbers 136 separate businesses. It may mean something or nothing that *only four* are located in the Pacific West, on your side of the Rockies. Two of these are sheet metal works, one on the Coast, the other inland. One has been converted to ship fabrication, the other to making cartridge clips. The third, another inland plant, normally makes special machinery and now makes blades, screws, keys for war purposes.

It is unquestionably proper to assume that almost any so-called small business in the Pacific West wishes to convert its facilities to war work if it could find the war work it can do. The story about the conversion of the smaller plants elsewhere, as revealed on the WPB list, should help some of the plants in the Pacific West to get a hint what they might do. Some of these plants that have been converted employ normally as many as 500 persons; some as few as three or four. A factory noted for its production of merry-go-rounds now does aircraft and tank work. Another that makes oil burners has been converted to production of machine gun parts.

A nationally known maker of fishing tackle boxes makes ammunition chests; one of the well-known producers of women's underwear makes mosquito netting. A small but prosperous auto parts plant now turns out aircraft parts. A firm that has built up a national business in orange squeezers and similar appliances makes bullet tools and gauges. A window screen factory makes aircraft windows; oil well rod manufacturer makes armor-piercing shot. A plant for many years devoted to motors and fans now makes machine gun turrets; a tractor plant makes tank transmissions. A California hair curler factory makes aircraft assembly clamps. On the other side of the continent a prosperous small maker of food machinery has been converted to make amphibian tanks. One cash register outfit has shifted to making automatic gun parts; a maker of beverage containers now makes oxygen tanks for planes.

Shifting Production

The list of shifts in production sounds like an industrial fairy tale. If the purpose were not so grim it would be inspiring. There is for instance the mid-western maker of lawnmowers who now makes hubs for tanks; and the maker of recording apparatus who manufactures airplane control parts. A moderate-sized electrical appliance manufacturer makes shell projectiles; a firm that has made egg poachers you probably use in your own home now concentrates on percussion caps. A manufacturer of gas heaters and boilers makes

One of the best-informed writers at the Nation's Capital, Arnold Kruckman, presents each month pithy comments on political developments and their practical application to industry of the West. Any reader who wishes additional information may write to him directly, using business letterhead, at 1120 Vermont Ave., N.W., Washington, D.C. Inquiries will be answered free of charge. Copies of pending congressional bills may also be obtained free of charge.

bogie wheels for tanks; a thermometer maker produces shell boosters.

A small but ancient safe factory has been turned into a factory for gun mounts; a carpet factory, nearby, makes (of all things!) gun barrels. We know, of course, the auto factories have been converted into

plants for tank engines, for airplane wing parts, and for airplane engines; but we are not apt to imagine that a manufacturer of toy trains can make binnacles, compasses, gun sights, bearings and couplings for the Navy. A firm, noted for automatic pencils, has been transformed into a producer of brass boosters for artillery shells; a bronze window maker now makes gun ring mounts; a manufacturer of radiators, convectors, and air conditioning equipment, makes many different products for the Army and the Navy. Another air conditioning equipment factory makes ship, plane and tank plants; and still another makes heating and cooling plants for war uses. Watch makers produce various precision instruments.

In the Mississippi valley there is a manufacturer of clothespins and other wood products who now devotes all his capacity to powder plant and arsenal fixtures. A nearby manufacturer of hand organs and pipe organs makes test tube stands. A firm that formerly made coffee strainers now makes flyers' kits; a manufacturer of stoves and furnaces makes powder cans; a New England aluminum products manufacturer makes lightning reflectors. Down in Texas a firm that used to make scientific instruments now makes machinery for special lenses; a sheet metal works in the South makes base plates and shell castings; a manufacturer of piston rings makes dummy fuzes; razor and blades makers make primers; silverware plants now make instruments for the Medical Corps; an oil well supplies producer makes inspection tanks for cargo vessels. A sash door works makes furniture for ships; clock makers manufacture armament, and so it goes all down the line.

Small Business Must Live

This writer has always believed and still believes that *small business*, wholesale and retail, unable to convert facilities to war work, should be provided with some resources to maintain its existence. The perpetuation of the much-discussed "American Way of Life" obviously depends upon the vast *middle class* which is another designation for the larger implications of small business. The greatest contribution America has made to the social and political advance of mankind is the creation of that vast reservoir of self-respecting, liberty-loving, intelligent and unobtrusive individuals of moderate means who belong to this middle class.

Arthur Balfour, one of the last of the great British aristocrats and political administrators, once told me that America differed from England in its middle class. America, declared Balfour, has produced in its middle class the greatest and finest average level of intelligence the world has yet evolved. Britain, he added, has produced the highest level of individual intel-

ligence. We Americans, he suggested, have lifted the mass to almost unbelievable levels by cultivating intelligent independence and initiative, while the British have reared a relatively small group of finely endowed and competent persons, by focusing upon the evolution of the carefully nurtured few. Like all generalizations, this holds a fundamental truth, but is relative in details. But it strikingly underlines that we have something we must preserve. There can be no doubt remotely that we can win this war and preserve the great advances Americans typify in mankind's history. To do both it surely appears necessary to examine carefully all suggestions that we must adopt a "modified capitalism" which consists of a "co-partnership" of Government-Labor-Management, "Government underwriting of whole industries," "stricter subordination (permanently) of Business to Government," and similar plans for collaboration.

Unity of Command

We will increasingly hear much about "unity of command," which is another phrase for concentration of authority. Apparently we need unity of command in really competent hands to win this war, but we also apparently need unity of will to maintain liberty. Possibly the next great step in human history will again come out of this western world when we Americans voluntarily subordinate our lives to the needs of teamplay, yet devise the means by which we insure our liberty against potential men on horseback among us. Political thinkers in this country at this moment are alive to the problem of scotching delusions of empire at home, as they have just been so tragically and so finally smashed for the white men in Asia. The disease of imperial glories will undoubtedly run its course through the Yellow World, and, via Russia, spread its Yellow Peril through Europe. But, if the thoughts of our leaders who have been meeting in earnest conference the past few weeks prevail, America will remain the home of the free, and will win its war against Empire and imperialists, whether labeled Naziism or something else.

Equipment Wins Wars

The miscalled middle class of small business is the stronghold of American individual liberty, and obviously holds the answer to those swollen integrations that are imperial whether you call them that or something else.

Never forget for a moment, if you can convert your business to war work, it is your imperative duty to do so. There is no remote question that we need every iota of machinery and skill that can be shifted to making things to fight the war. The war will be won by superior equipment—equipment not only superior in quality and

quantity, but superior in its novelty and utility. We need new appliances with new ideas for the use of the fighting men. The war will unquestionably be won by superior equipment that incorporates new ideas. It is not unlikely that the mechanical equation which will win the war has not yet impressed itself on our consciousness. It may already be in existence, or it may be on the way.

Bear in mind, it was the little cheese-box Monitor, Erickson's dream, derided by the Navy brass hats, that turned the tide of the Civil War. We have the very real high grade of individual intelligence in our armed forces that can make better use of machines and mechanical appliances than probably any other Army or Navy in existence. It is the exceptional young man of America who does not know how to fix his automobile, who has not fussed with a radio, or who doesn't know something about planes and engines. It is for him you will be making things in your shop or your factory. And don't worry too much about the present apparent mess in Washington. There is nothing fundamentally wrong with our professional soldiers and sailors. They know their business. They are fine in every sense of the word. They know as we know that some of the organization has been muscle-bound. Tradition, custom, political emphasis instead of emphasis on the real military aspects of the war, have clogged the machine.

Fan-dancers and posturing commanding chiefs and experts who learned the military science in politics will disappear. The tough realism of the people at the grass

roots is beginning to roll into Washington like a tidal wave. It begins to look like a hard summer for the \$30,000,000 worth of press agents and the professors. General Marshall is one of the most brilliant soldiers in existence, and when the impatience of the people begins to put the damper on the slogan-makers, Marshall will have the release necessary to enable him to get his Army really rolling. Nelson has already started. He is focusing on production for war. That grassroots tide also favors him. It will toughen him where he is inclined to be soft, and it will stiffen his resistance to the mercurial volatility of the politicians.

If your business is convertible to war work, get set as swiftly as possible. Six months from now you will have to justify your business or probably quit. Off the record we hear in Washington that by fall power and fuel will be available only to those who make things for war, or who make things essentially necessary for the civilian population. We have already been repeatedly told that electric power is constantly growing scarcer in relation to expanding needs, that oil supply is dwindling, natural gas is already rationed.

You also confront the very probable chance that your resources will be requisitioned if they are needed and if you are not making the best use of them for the purposes of this war. Priority Director Knowlson, head of the Stewart-Warner Corporation, is the man empowered to make requisition. The law gives him authority to take the dishes off your table, and the machines out of your factory, if he determines they are necessary for the war.

• Morenci Open Pit Copper Mine at Morenci, Ariz., owned by Phelps Dodge Corp. Years of preparatory work were necessary to enable present operations, all part of the expansion of base metal production of the West. The Morenci Mine is exceeded in output only by the Utah Copper Co., Bingham Canyon Mine and that of the Chile Exploration Co. in South America.



ACCIDENT FREQUENCIES

How Is Your Plant Safety Record? Strict Attention to Modern Prevention Methods Pays Dividends in Both Money and Efficiency; This Material Will Enable You to Gauge Your Individual Standing

By R. P. BLAKE

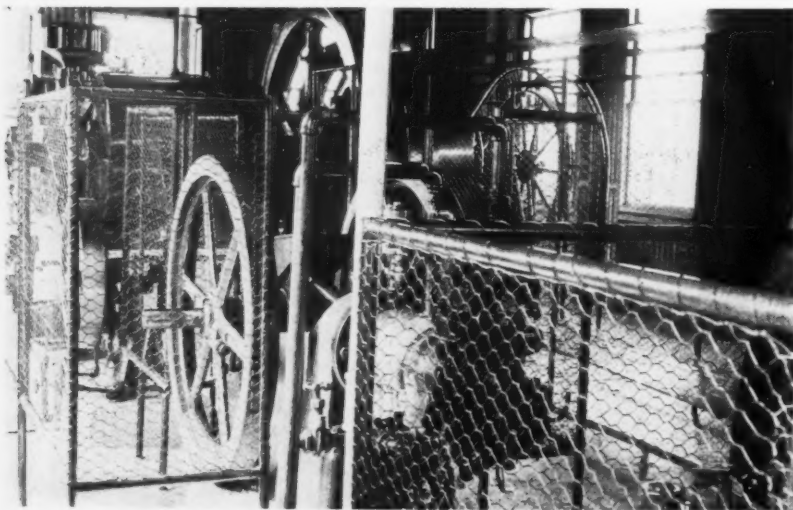
IT IS becoming generally realized that occupational accidents constitute a continuing drain on our national economy that is particularly serious in the present emergency. Moreover, it is increasing as our war effort expands. The 1940 total of 18,100 fatalities, 89,600 permanent partial disabilities* (lost fingers, hands, feet, eyes, etc.) and 1,782,000 temporary disabilities were, it appears, exceeded by some 10 per cent during 1941—and accidents continue to increase. Our first objective must be to halt this upward trend; and with this enemy advance line broken, the next objective will be to throw him backward.

Just how serious was the loss in 1941? The 1940 figures will yield a basis. The U. S. Bureau of Labor Statistics estimates actual working time lost during 1940 by injured workmen as 140,000 man-years. Additional, of course, is the loss (not capable of measurement) due to the 18,100 deaths and the lessened effectiveness involved in the 89,600 permanent disabilities. For the 1941 total of the accident waste in industry, add 10 per cent. For 1942—what?

Where do all these injuries come from? The great plants crowded with war work? No—only in small part. The great manufacturing plants are almost without exception doing an excellent job of eliminating accidents. Almost all of them have frequency rates under 20; many, under 10;

*U. S. Bureau of Labor Statistics—Serial R-1353.

Below is shown an outstanding example of accident prevention through the use of wire guards around moving machinery parts; small plants unable to employ full time safety personnel are sometimes lax in providing and enforcing safety methods.



and the leaders in safety, under 5. Workers in a plant whose frequency rate is 5 are fortunate indeed, for that is equivalent to only about one lost-time injury per worker per century. Only about one worker out of three hurt once during his working lifetime. In such a plant, a worker is undoubtedly safer than when he is in his own home.

How is your plant safety record? Is it average or perhaps getting out of bounds? R. P. Blake, nationally known writer on plant safety, here furnishes an excellent gauge and shows what are considered by experts as reasonable accident frequencies and severities for a representative number of industries. The article is particularly timely for the management of small and medium sized plants, many of which cannot employ full-time safety personnel. The writer is affiliated with the U. S. department of Labor, division of Labor Standards, though the views expressed and gained from wide experience in safety practice are entirely his own and not to be attributed to the government organization.

Most large firms in most other industries are also doing a fine job, particularly in the public utilities, in metal mining, and in oil refining. The construction industry has done much, but needs to do much more for this industry shows high frequency rates, namely 47 for 1939 and 37 for 1940.

Construction work is everywhere recognized to be inherently hazardous yet individual firms have repeatedly proved that even here accidents can be practically eliminated. Frequency rates under 10 have been achieved on important jobs and some even under 5. It can be done and it pays to do it.

The logging and lumbering industry holds the unwanted position of undisputed leadership at the top of the frequency table in all sections of the country with frequency rates for logging of 104.9; for sawmills, of 45.6; and for planing mills, of 34.1.

But important accident contributors as the construction, logging, and lumbering industries are, they still yield a relatively small part of the total. Where are the rest from? Mostly from the multitude of moderate-sized and small establishments and businesses the country over. Their frequency rates are mostly not shockingly high—just not low enough. Some are probably under 10. A few may be under 5. A good many more are under 20, but they mostly appear to have frequencies of 30 or 40 or 50 or more. One list of over 500 firms, representing practically all branches of industry, showed an average frequency rate over a 5-year period of about 45. They averaged 29 employees each. This was not a selected list, just—so far as could be determined—a representative lot and probably presented a fairly good picture of what the accident experience of small business in general is like.

Small Plants Lag

Are small employers less concerned for the safety of their employees than are the great corporations? There is no reason to think so. In fact the reverse is probably true because the "top boss" of a 50-man business is close to his workers and an injury to any of them is usually a more or less personal thing to him. But there are perfectly understandable reasons for the lag in safety performance by small business generally. The following conclusions seem to be fully justified:

- (a) The small firm cannot employ full-time safety personnel;
- (b) The small firm executive carries a complex load and lacks the aid of a technical staff;
- (c) He rarely joins such organizations as the National Safety Council or attends safety congresses;
- (d) Small firms generally lack adequate cost-accounting systems;
- (e) The accident rate has to be extraordinarily bad in a small working force in order to yield a flow of injuries sufficient to arouse a management immersed in its manifold problems of sales, finance and production;

- (f) Small firms usually are less willing to make expenditures for which they cannot see certain prompt return.

The above analysis justifies discussions such as this, because the outstanding conclusion that may be drawn from the sum total of safety accomplishment to date is that the faithful application of common sense is all that is needed to turn poor safety performance into good performance. Any management that will use the brains God gave it can eliminate almost all its employee accidents. It is a matter of attitude of mind and application of effort. The fact that a relatively small number of industrial firms (mostly the large ones) and a still smaller proportion of our people as yet know this, indicates the size of the job the forces of prevention have ahead of them. In a very real sense it constitutes an indictment of all of us who are professionally engaged in the safety field, for we have yet largely failed to spread the word—we haven't sufficiently studied and considered the needs and viewpoints and problems of those we seek to help. As a result the executive of the small business finds safety information that will be helpful to him hard to come by. He has little contact with those who know what good safety performance is or who talk the language of the safety practitioner. He does not know how to measure his own performance. This finally brings us to the point of this discussion—what are good frequencies? It is important to know because human nature being what it is, to know what good performance is to desire to reach it. There is no doubt that if every management in America whose accident rate is not good realized that fact, most of them would at once ask: "Just how bad am I?" and next: "What must I do to improve?"

Frequency Rates

That is what frequency rates are for—to measure safety performance. A moment's thought will make it evident that the flow of human injuries from any business or operation constitutes the true measure of its safety in actual operation.

"How often do the accidents occur?" Obviously the answer must take into account the factor of exposure which can best be expressed in terms of hours worked. It is evident that for any given set of conditions the probability of injury will be in proportion to the number of hours worked.

A number of years ago a group of safety engineers sat in a "smoke-filled" room and put together the definition of frequency rate that has received approval as "American Standard," namely: Frequency is the number of lost-time injuries per million man-hours worked. Expressed as a formula it becomes:



•This is not an advertisement for a manufacturer of safety shoes. A wide-awake plant operator here calls attention to the necessity of using proper clothing. Posters supplied by the National Safety Council.

$$F = \frac{\text{Number of injuries} \times 1,000,000}{\text{Man-Hours worked}}$$

A plant that had 10 lost-time accidents while it was working 200,000 man-hours would then have for that period a frequency of:

$$\frac{10 \times 1,000,000}{200,000}$$

or 50

It would take almost a year—50 weeks—for a hundred-man plant, on a 40-hour week, to work 200,000 man-hours. A frequency rate of 50 is bad in any business. It shouldn't be over 10 in any manufacturing industry. That is, such a plant—100 employees—shouldn't have over 2 lost-time injuries per year and for really top rate performance, it shouldn't have over one.

But what is a "lost-time injury?" Under the accepted definition, a lost-time injury is one that renders the injured person unable to return to any regular job in the plant on the calendar day following the day of his injury. It has been found unwise to include injuries requiring first aid treatment only, because to do so is likely to lead employees enthusiastically, cooperating in the drive for a better record, to hide minor injuries instead of reporting them for proper treatment.

Some will ask why the basis of comparison was set at 1,000,000 man-hours. Why not 100,000 hours or 10,000 hours? The answer is that a million man-hours is sufficient exposure to allow the law of averages to apply. Therefore the frequency rate from an exposure of one million man-hours may be taken as a quite accurate measure of the safety of any establishment as it was operated during that period. A

basis of a half million man-hours gives a fair degree of accuracy. Frequency rates based on 100,000 man-hours are indicative but comparisons should be made with caution when the base is so small.

It is impossible to fix definitely for the various industries the frequency rates that represent the upper limit of good performance. In the first place, accident statistics are incomplete. Secondly, some industries have made much greater progress in reducing accidents than others have; and, therefore, their present accident experience does not reflect their inherent hazards accurately. Probably the frequency rates published by the National Safety Council from the experience of its some 5,000 member firms gives the best guide to what good performance is. However, this data must be used with great caution. As an instance, the Safety Council membership frequency rates for the laundry and cement industries for 1940 were 5.87 and 4.90 respectively. But during the quarter century of effort on an industry-wide basis, the cement industry has reduced its accidents over 90 per cent. The laundry industry has achieved no similar degree of industry-wide organization for safety, and even the portion of the industry that has National Safety Council membership has shown relatively little gain. A similar comparison would apply to a number of other industries notably steel, petroleum, and public utilities.

With the above qualifications clearly in mind, however, the author suggests the following as frequency rates that should be considered as about the upper limit of reasonably good performance. Anything higher should be considered as definitely

(Continued on page 24)

CHINESE PICTURE

An Awakened China Should Take Its Place Among the Modern Industrialized Nations as a Result of the War But Presents Many Problems—Capital, Labor, Management, Transportation and Policy

By DR. H. D. FONG
Economist and Expert on Chinese Affairs

FORTUNATELY, the four years and half that have elapsed since the outbreak of the Sino-Japanese war are pointing towards a new era of industrial reconstruction in China. China is truly emerging as a full-fledged independent nation in the course of the war. The retreat to the great interior hinterland has enabled China to carry out a program of industrial reconstruction unshackled by any restrictions imposed upon her by the "unequal treaties." In this great hinterland—China's Southwest and Northwest—she is alone in the field, and can do what she deems to be in her best interest. Both Soviet Russia and Germany—the former as a policy and the latter due to defeat in the first World War in which China was also a participant—already have relinquished their extraterritorial rights in China; announced their readiness to surrender these rights at the conclusion of the war. The way is thus open for China to exercise her sovereign rights as a full-fledged independent nation, and in respect of industrial reconstruction to adopt a policy that will, besides serving her best interests, not conflict with the fun-

damental objectives of a stable economic order in a post-war world.

This article by Dr. H. D. Fong was prepared in response to a request for his views on current war industrial problems of China and post-war economic factors. Part of the material was used in a lecture very recently delivered before the Fletcher School of Law and Diplomacy. The four factors of production which relate especially to the internal economics of individual industrial enterprise in China will be discussed in a second article to appear in the April issue of WESTERN INDUSTRY. On the assumption that we will win the war, Dr. Fong's views are particularly pertinent to those of us here in the Pacific West which will take the major role in supplying the needs for the rehabilitation of China.

The prospect for China's industrialization depends upon a number of factors. These factors embracing capital, land, labor, management, transportation, and government policy, are not all too favorable to China's rapid industrialization in the near future, but hopeful signs are nevertheless not entirely lacking. One outstanding evi-

dence of these is the heroic effort being made by the Chinese government at wartime industrialization. The attempts being made already have brought industrial production in "free China" to an unusually high level—unusually high in view of the immense difficulties which thus far have been encountered, including among others the completeness of the enemy blockade and the absence of adequate means of modern transportation and industrial production. Recent statistics for the first three or four years of war in "free China" have shown, for example, a several fold increase of many industrial products for the satisfaction of both military and civilian requirements.

China's Fiscal Record

Recently, a 500,000,000-dollar credit was extended by the United States to China and 50,000,000-pound credit granted by Britain. These loans are not likely to be all used for immediate war purposes. In the immediate future, China will use only a small portion of the loans for building railways and highways and as security for issuing some government bonds. The larger portion of the loans will be utilized for post-war reconstruction purposes. In giving these loans, the American and British Governments assured the Chinese Government that they stand squarely behind it not only in the execution of the war, but also in the establishment of peace and security. Needless to say, the Chinese are tremendously satisfied with the attitude of the United States and Britain.

Let us look at the record of the Chinese Government in connection with the previous loans extended by the United States. Of total obligations to the United States of around \$109,000,000, China has paid back \$35,000,000. The first loan of \$25,000,000 was given in December, 1938, extended by the Export-Import Bank—China actually has borrowed \$22,000,000 and has repaid \$18,500,000. The second loan of \$20,000,000 was given by the same bank in March 1939. China was to pay in tin. Up to now, China actually has borrowed \$13,000,000 and paid back \$2,200,000. In other words, China has lived up to her promises, even under most trying war conditions.

With the spread of western culture and civilization, industrialization has assumed a phenomenal growth in many parts of the world. In the west, notably in north-western Europe starting with the British Isles, industrialization began a century and half ago. In these countries, coal and iron, together with capital accumulated mainly from maritime and colonial commerce, could be found in abundance and in conjunction with a spirit of enterprise, unfettered by government restrictions. As time goes on, industrialization acts not only as a spontaneous, unconscious, and

•Primitive labor methods enable China to carry on the war; Chinese labor lacking modern equipment hollowed these caves out of solid rock for air raid shelters using hand chisels.



self-generating factor for nation-building, but also transforms itself at once into a deliberate, conscious and planned policy of all governments, in the hands of far-sighted statesmen. Great Britain, France, Belgium, and the United States are examples of the former category; while Germany, Russia, Italy, and Japan may be cited to illustrate the latter.

China is no exception to this general trend of development. Here the need for industrialization is no less urgent than in any other country. Both economic poverty and military decadence have been strong factors in favor of industrialization. Under a predominantly agricultural economy, China's poverty is accounted for largely by the unfavorable man-land ratio, which gives rise to the perennial struggle of an overcrowded population for the limited supply of cultivable land, while her military decadence increased through the successive defeats which she suffered at the hands of industrialized powers since the Opium War of 1841-42.

Early Industrialization

Attempts at China's industrialization were launched as early as the reign of Emperor Tung-Chih after 1862. Under the leadership of Tseng Kuo-fan, Tao Tsung-tang and Li Hung-chang, the statesmen responsible for the revival of the Manchu dynasty after the Taiping Rebellion, several factories were established for the manufacturing of ammunition. This period, lasting from 1862 to 1877, was followed by commercial product manufacturing during 1878-94, influx of foreign enterprises from 1895 to 1911, industrial prosperity under Chinese initiative from 1912 to 1931, depression and attempts at recovery from 1931 to 1936, and finally the retreat towards the great interior since 1937. Throughout this long period of eighty years, China has followed the lead of western industrialized nations in her feeble attempts at industrialization, thwarted at many points by civil war on the one hand, and by foreign invasion on the other.

The achievements to date, although meagre when judged by western standards, represent nevertheless considerable departures from the erstwhile agricultural economy known to China since the dawn of her history four thousand years ago. In assessing, with lessons of history, the prospects of China's industrialization, the task here is merely to point out the main factors that have facilitated or retarded the progress of industrialization. The problem as to what are the principal fields in which lie the future of China's industrialization will have to be reserved for discussion some other time.

Capital, land, labor and management are the four factors of production which relate

especially to the internal economics of individual industrial enterprises. Among the factors standing out with greatest prominence which affect external economics must be included transportation in the first place, and government policy in the second. In England, the first stage of Industrial Revolution was marked by improvements of roads and canals, while the second occurred side by side with the introduction of railways and steamships. Just as mechanical inventions in industry brought about the Industrial Revolution, so their application to transport ushered in the Commercial Revolution. Indeed, the role of transport in industrial development cannot be overestimated. No country in history could expect to transform its industrial life without simultaneous revolution in transport.

To a continental country like China, mechanical transport is indispensable to industrialization, as was the case of the United States after the Civil War, or of the Soviet Union after the November Revolution in 1917. But transport in China has been in a most backward condition. With a population of 450 million and an area of 11,000,000 square kilometres, she only had 17,400 kilometres of railways and 85,000 kilometres of motor highways before the war. Much traffic, therefore, is local and handled by such primitive means of transport as wheelbarrows, junks, mulecarts, pack-horses and coolie labor. The cost often is prohibitive, and the service most uncertain.

The conditions prevailing even today in the interior parts of the country are reminiscent of England during the early days of the Industrial Revolution. Young, in his *Six Months Tour through the North of England* (1768, published 1770), con-

sidered the main road between Preston and Wigan as "infernal," to be avoided by travelers "as they would the devil."

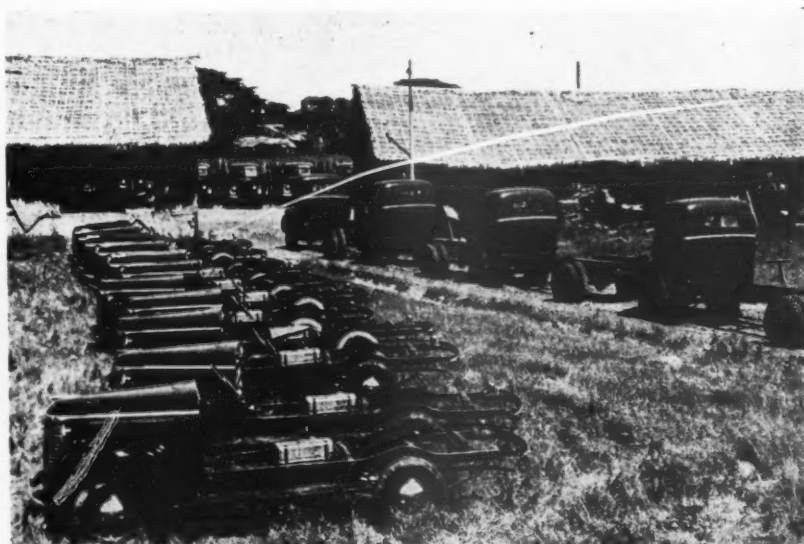
(1) Experience of this sort easily can be repeated in China, even in the vicinity of leading industrial centers like Tientsin. (2) Under such conditions of transport, it is but natural that China's industrial enterprises before the war were mostly located along the coastal ports and other cities easily accessible to railways or steamship navigation. Indeed, Chinese industrial centers developed like a crescent around the coast from Antung in Liaoning southward to Pakhoi in Kwangsi; while except Hankow, the great hinterland remained untouched by modern industrializing influence.

Finally, the failure of the government to adopt a persistent policy for the protection and encouragement of industry has considerably impeded the course of China's industrialization. It is an undeniable fact that China, on account of the encroachments upon her sovereignty under the bondage of "unequal treaties" concluded with foreign powers in uninterrupted succession since the days of the Opium War of 1841-42, in the words of Dr. Sun Yat-sen, "everywhere becoming a colony of the Powers . . . China is the colony of every nation that has made treaties with

Continued on next page

- 1—Quoted in Fay, *Great Britain from Adam Smith to the Present Day*, 1940, p. 175.
- 2—See my monograph on rural weaving and the merchant employers in a North China district, Nankai Institute of Economics, Tientsin, 1935.

• Transportation is a major problem for China; American plants supply 95 per cent of the trucks; only chassis are shipped from here; a huge roadbuilding program looms after the war.



her, and the treaty-making nations are her masters. China is not the colony of one nation, but of all." (3) As a "colony" in fact, if not in name, China is bound to leave her industries unprotected. She had thus in the early forties of the last century given away her tariff autonomy, a very important instrument for industrial protection, until its recovery in 1929, and according to Dr. Sun, consequently had sustained an annual loss of \$500,000,000 (pre-war value) through invasion of foreign goods. Nay, she had to stand a further loss of industrial protection under the 1895 Treaty of Shimonoseki according to which foreigners were allowed to erect factories on Chinese soil, thus evading the payment of a stipulated tariff of five per cent ad valorem altogether. In other respects, the foreign manufacturers enjoyed superior advantages over the Chinese.

Greater financial backing, easier access to shipping facilities in Chinese waters because most of them were owned and operated by foreign companies, better technical staff and equipments, surer protection against illegal levies and exactions by provincial and local warlords afforded by the system of extrajurisdiction rights—all these and other advantages placed the Chinese manufacturers under serious handicaps in the race for equality against their foreign comrades. Not "protection to infant industries,"

WESTERN BUSINESS INDEX										
Production and Employment—										
Index numbers, 1923-1925 average=100										
Compiled by the Federal Reserve Bank of San Francisco covering the Twelfth Federal Reserve District (California, Oregon, Idaho, Washington, Utah, Nevada, and part of Arizona)	With Seasonal Adjustment—			Without Seasonal Adjustment—			Annual Average			
	(1941—1940)			(1941—1940)			1941		1940	
	Dec.	Nov.	Dec.	Dec.	Nov.	Dec.	1941	1940	1941	1940
Industrial Production¹										
Manufactures (physical volume)										
Lumber	113	109	110	87	103	85	107	91	107	91
Refined oils	—	—	—	174	176	159	173	158	173	158
Cement	211	177	159	156	177	118	159	121	159	121
Wheat flour	112	94	118	112	103	118	120	118	120	118
Minerals (physical volume)										
Petroleum	—	—	—	96	99	91	96	93	96	93
Lead (U.S.) ²	—	127	116	—	128	118	118	116	118	116
Copper (U.S.) ²	154	152	145	155	156	146	153	142	153	142
Construction (value)										
Residential building permits ³										
Twelfth District	58	100	107	45	93	85	87	70	87	70
Southern California	63	65	131	54	66	113	85	75	85	75
Northern California	32	155	79	22	137	54	82	61	82	61
Oregon	60	39	43	36	31	26	53	45	53	45
Washington	65	213	83	37	185	47	124	69	124	69
Intermountain states	166	93	97	108	81	63	124	100	124	100
Public works contracts	—	—	—	323	502	459	521	292	521	292
Miscellaneous										
Electric power production	290	284	251	274	269	238	259	231	259	231
Factory Employment and Payrolls⁴										
Employment										
Pacific Coast	212	199	148	206	202	144	175	128	175	128
California	264	246	174	260	252	171	211	146	211	146
Oregon	149	146	122	142	145	116	134	109	134	109
Washington	140	134	111	133	134	106	124	101	124	101
Payrolls										
Pacific Coast	284	261	157	278	261	154	214	130	214	130
California	348	321	184	346	324	184	256	150	256	150
Oregon	218	188	135	196	184	122	166	106	166	106
Washington	184	169	112	177	168	108	152	102	152	102

¹Daily average.

²Prepared by Board of Governors of the Federal Reserve System, (1935-1939=100.)

³Includes figures from 197 cities and Los Angeles County, unincorporated.

⁴Excludes fish, fruit, and vegetable canning.

tries," but "protection to foreign industries" carried the day; except for the temporary relief afforded to the Chinese manufacturers, especially cotton mill owners, during the first World War during 1914-1918, Chinese industries could not have prospered the way they did during these years.

With the return of foreign imports after the cessation of the first World War, Chinese industries, whose growth during the war years was indeed rapid but very unsound in finance and organization, immediately had to undergo a prolonged period of depression. The appreciation of silver currency following the abandonment of the gold standard and the adoption of the American silver purchase policy in the early thirties brought about a deflation in China, and Chinese manufacturers had to join hands with the world industrialists in their common fate until the establishment of a managed currency in China in 1935. They were tending towards recovery under the National Government when another catastrophe, wiping out a large part of China's modern industries built through thick and thin in the course of the last eighty years, took place—the death knell that announced the titanic struggle between China and her perennial enemy Japan, on July 7, 1937.

3—*San Min Chu I* (The Three People's Principles), tr. by Frank W. Price, Commercial Press, 1929, p. 38.

WOOD PULP

Consumption of All Grades Last Year Increased One Million Tons on Fears of Possible Shortage

TOTAL consumption of all grades of wood pulp in 1941 was close to 11,000,000 tons and of all chemical grades approximately 8,960,000 tons, the latter being a 1,000,000-ton increase over 1940, according to estimates of Ossian Anderson, president, Puget Sound Pulp & Timber Co.

Domestic production of chemical grades was also about 1,000,000 tons higher in 1941, reaching a record total around 8,060,000 tons, and excess of imports over exports provided about 640,000 tons additional for domestic use. Domestic production plus import balance fell about 260,000 tons short of apparent consumption of chemical pulps, causing approximately that much depletion of reserve supplies.

These preliminary estimates on output of wood pulp and chemical grades were made by Ossian Anderson, president of Puget Sound Pulp & Timber Co. of Bellingham, Wash., probably the largest producers of unbleached sulphite wood pulp in this country. Large demand for wood pulp last year was increased somewhat by fears of a possible paper shortage and resultant forward buying, in the opinion of Anderson.

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WESTERN SUGAR BOWL

Beet Sugar Producers Now Will Be Permitted To Increase Output Owing To Curtailment Of Cane Supplies From Insular Possessions And Cuba—California And Colorado Are Largest Producing States

SUGAR, which only yesterday was produced in overseas areas in staggering surpluses, becomes the first food to be rationed in the United States in World War II.

To thousands of business enterprises, large and small, a rationing of sugar means a substantial curtailment of operations. To millions of American housewives it means that war has entered the kitchen, probably to remain there for the duration.

The domestic beet sugar industry this year will be called upon to supply one-third of the total sugar available for the nation's sugar bowl. Last year about one-quarter of the sugar consumed in this country was supplied by domestic beet producers, the balance coming from prolific cane sources. While sugar beets are produced as far east as Indiana, Ohio, and Michigan, the western growers and processors will supply the bulk of the beet product.

California now leads all states in the production of home-grown beet sugar with Colorado a close second. Montana and Michigan vie for third place. Of the 11 western states, all are substantial producers of the beet processed into sugar in nearby mills with the exception of Nevada, Arizona and New Mexico.

Immediately, the output of domestic beet cannot be increased. Growing shortage of farm labor looms importantly. Larger plantings can be planned for early 1943. Result of the war, the domestic beet producer is likely to get a better break than he has in the past when he was surrounded by marketing restrictions under a government controlled system—and still is for that matter.

Sugar Control Act

The Sugar Act of 1937 which is still effective is somewhat of a utopian idea of Uncle Sam trying to take care of everybody. Over-production has been consistent in our suppliers—continental possessions and Cuba. Provision had to be made to insure a place in our domestic market for the Philippine output—these islands were nevertheless ardently looking forward to their freedom set for 1946. A place had to be found to take care of Cuba's output or at least a good part of it. Prolific producers, Puerto Rico and Hawaii had their place in the sun.

All this was administered under the department of Agriculture through the Sugar Act which set definite marketing quotas for domestic and tariff-favored producers not on this continent.

Why the sugar shortage that makes the rationing necessary? The reasons are few and understandable:

First—in 1941 the United States consumed nearly 8,000,000 tons of sugar, the all-time peak, and at least 1,000,000 tons in excess of normal. This rate of consumption made serious inroads on reserve stocks.

Second—Shipments to the United States from the Philippine Islands, which usually run about 1,000,000 tons a year, have been entirely cut off by the war. Moreover, the Office of Price Administration considers it likely that Hawaiian producers and other off-shore areas of supply will be unable to market their usual volume of sugar because of difficulties in shipping.

Third—The United States is under commitment to make large supplies of sugar available to Great Britain, Canada, Russia, and perhaps to others of the United Nations. These supplies of sugar are to come out of the Cuban crop, recently purchased by the Defense Supplies Corporation.

Fourth—More than a million tons of the Cuban crop now being harvested will be converted into molasses, rather than into sugar, to be used in the production of alcohol. The alcohol is essential in the production of gelatine dynamite and smokeless powder.

The gravity of the supply situation is shown in the accompanying table prepared in the Office of Price Administration in Washington:

"These facts mean," Mr. Henderson stated, "that both overall industrial and household uses of sugar must be cut about one-third below the very high per capita totals reached in 1941. It may be that as the year progresses our estimate of available supplies for United States consumption can be revised upward. But we cannot afford to act on that assumption now."

If the situation does improve the restrictions can be relaxed later.

"At the present time it appears that household consumption of sugar will have to be reduced from about 74 pounds per capita in 1941 to around 50 pounds and that consumption in industry will have to be reduced from 40 pounds per capita in 1941 to 27 pounds in 1942. Although the decline in household consumption now anticipated represents a 33 per cent drop from the very high 1941 level, it is only about 22 per cent below the 1938 figure when household consumption averaged 64 pounds per capita."



Sugar beets grown in Western areas are larger than those used on the table—August Ehlen, Adams County, Colorado farmer exhibits his product.

One significant fact in OPA's statistics is that the beet sugar industry, born and cradled in the western states, will in 1942 become the chief single source of sugar supplies for the consumers of the nation. It means that these consumers will have 3,750,000,000 pounds more sugar in their sugar bowls than if the industry did not exist—enough for 80,000,000 men, women and children under the current rationing of 12 ounces a week. To the producers of beet

SUGAR SUPPLIES

Area	SUPPLY IN 1941	ESTIMATED FOR 1942
	Short Tons	
Domestic beet sugar.....	1,940,000	1,750,000
Domestic cane sugar.....	408,000	450,000
Philippines	854,000	None
Hawaii	903,000	500,000
Puerto Rico	993,000	1,100,000
Virgin Islands	5,000	5,000
Cuba	2,696,000	1,070,000
Other foreign countries.....	190,000	35,000
Miscellaneous (frozen stocks, etc.).....	None	390,000
Totals.....	7,989,000	5,300,000

BEET SUGAR OUTPUT BY STATES

(Bags of 100 pounds)

State	1940	1939	1938
California	9,198,783	9,060,265	6,741,870
Colorado	6,250,729	5,348,464	6,103,411
Michigan	3,348,989	3,237,790	3,427,364
Montana	3,269,444	2,800,599	2,837,370
Idaho	2,904,616	2,547,049	2,855,520
Nebraska	2,302,958	2,114,782	2,705,911
Wyoming	1,863,335	1,837,702	2,121,122
Utah	1,476,622	2,011,772	2,212,149
Ohio	899,141	834,380	862,201
Minnesota	891,274	680,970	913,617
Oregon	748,000	719,840	698,570
Washington	645,170	642,828	571,981
Iowa	428,138	370,038	432,172
Indiana	301,661	274,517	301,251
Kansas	273,693	142,755	223,468
South Dakota	246,671	177,357	307,316
Wisconsin	238,685	176,540	320,262
Totals.....	35,287,909	32,977,648	33,635,555

sugar, farmers and processors alike, it means something more: they feel it means the complete demonstration of their argument that production of sugar within the continental United States, where it cannot be endangered by the hazards of wartime shipping, is sound and intelligent national policy.

In the face of extremely keen competition, and often in a politically hostile atmosphere, the beet sugar industry has made steady progress since World War I. When the United States entered the last great war, the annual production of beet sugar had averaged about 800,000 tons, or 15,000,000 one-hundred pound bags. In recent years it has been more than twice that much, as shown by the table of beet sugar production by states.

Statistics on the production of beet sugar in 1941 are not complete, but it is expected to reach about 31,000,000 bags.

Reduced 1941 beet sugar production, reflected in the 1942 supply, followed 17 per cent acreage restriction imposed in 1941 on beet farmers who vigorously protested against curtailment of internal sugar production in face of impending war. It was folly, they argued, to depend on remote overseas sources for 80 per cent of America's sugar supply. Their protests were referred to a statistical wailing wall behind which abundant Philippine and Hawaiian supplies would be grown indefinitely, in the judgment of Washington sugar authorities. Pearl Harbor blasted sugar out of the realm of statistical theory; sugar became a reality you could buy at the store or you couldn't. Warnings and appeals have given way to rationing, and if you don't take your authorized 12 ounces a week from the sugar bowl when it's being passed, says Mr. Henderson in effect, it won't do you any good to go back and ask for it.

The eighty million consumers using beet sugar in 1942 will find that beet and cane sugar are interchangeable for every sugar purpose. "By no chemical test can the pure crystallized sugar from these different sources be distinguished," states the Department of Agriculture, Bulletin 535.

A summary of the beet sugar industry shows approximately 100,000 farmers in 19 states served by 85 operating factories. The beet sugar belt goes through the Great Lakes Area, northern plateau and Rocky Mountain States, to California.

The beet industry now produces its en-

tire seed supply, superior as to yield and sugar content compared with foreign seed on which the industry was entirely dependent at the outbreak of the war 1914-18.

Seed improvement is characteristic of the internal resourcefulness of the industry which reported more than 200 research projects in process at the January meeting of the American Society of Sugar Beet Technologists in Salt Lake City.

Mechanization of field operations hitherto done largely by hand labor has been achieved experimentally through a co-operative program undertaken by the United States Beet Sugar Association, the Department of Agriculture and the University of California.

Harvest of the 1942 crop will see for the first time commercial operation of mechanical beet topping and digging machines working side by side with Spanish-American field workers on western farms. Mechanization of spring work centers on successful experiments in breaking the traditional beet seed, which is actually a ball-like cluster of seeds, into single-germ segments. These segments can be planted at spaced intervals, enabling great reduction and possible elimination of hand labor previously used for "bunching and thinning."

Transition to mechanization of field work, however, must be gradual in the opinion of beet technologists who anticipate that customary labor requirements will prevail in production of the enlarged 1942 crop on which there will be no governmental restriction.

* Sugar beets are given a thorough bath when brought into the factory. Farm labor is growing scarcer and beet processors are striving for greater mechanization—field operations hitherto largely by hand are being mechanized in the West.



INDUSTRY TRENDS AND POINTERS

Dairy Problems

CLOSING days of last month, saw the Pacific Coast dairy industry still on the spot.

How to continue deliveries of milk and at the same time conserve tires was the problem which had not yet been worked out but is being given intensive study. Dairy industry representatives said frankly that they were trying to muddle through. Universal complaint was on the vagueness of government officials in Washington who told dairymen that milk must be delivered but gave no official intimation as to what cooperation could be expected. Any attempt at industry cooperation might run afoul of the Department of Justice.

Dairy officials were optimistic that some solution would be worked out. Meanwhile awaiting some intimation or ruling from the government, some dairy chains in Pacific coast cities started serving two routes using two men but only one truck. Under discussion last month were possibilities of industry cooperative zoning, deliveries every other day and other economies to save rubber.

Tungsten

Tungsten is on the critical list. It's scarce. Silver is more plentiful and is helping to save tungsten. There is no need, for example, to make high-speed steel tools entirely of high-speed steel. Only a small tip need have the tungsten-bearing alloy according to the American Silver Producers Research Project. Practically all the

rest can be of carbon steel—thanks to the use of silver brazing alloys for making a secure joint between the two other metals. A joint less than 0.003 in. thick turns the trick, hence mighty little silver is needed and the cost is slight. The same is true in millions of joints brazed with silver alloys or made with silver solders. Such joints stay put. They are serving scores of defense needs—among many others—and are destined to still wider use according to the silver researchers.

Machine Tools

Sales and deliveries of second-hand machine tools will be controlled. Second-hand tools have been under very little priority control so far. Government claims critical machine tools have been purchased heavily by companies not engaged in urgent war production. WPB order makes all provisions of Priorities Regulation 1 apply to transactions in second-hand tools.

Bristle Shortage

Brushmakers and their products—the tooth brush, the hair brush and the paint brush—were affected last month by WPB order designed to save hog bristles, most of which come from China. Products not designed to Army and Navy specification must use 45 per cent of some other material in their brushes. Substitutes are urged—use of reclaimed materials a prospect. Nylon bristles (scarce), sisal fiber and badger hair are possible substitutes. Nylon bristles can replace Chinese hog bristles but can't be had in any quantity.

Western Manganese

Serious aspect of the Japanese success in the Pacific threatening free movement of Allied ships in the Indian ocean is the possibility of cutting off supplies of manganese, essential in steel-making. India and Russia combined produce 60 per cent of world output. Russian supplies were cut down to a very small flow, months ago.

Shipments from India are now threatened. Result will be a feverish effort to step up home production.

Recent report of the department of the Interior recommending development of base metal resources in this country acting in conjunction with a Senate sub-committee headed by Joseph C. O'Mahoney (D., Wyo.) as it affects western territory proposed the following:

Arizona: Construction of a milling plant to produce 240,000 long tons of manganese metal at Artillery Peak and plant at Parker dam to produce 30 000 tons. Mining operations to be conducted in these districts.

California: Manganese ore production in the Parker dam district.

Montana: Construction of a custom mill at Philipsburg to produce 90,000 tons annually with mining operations in this district.

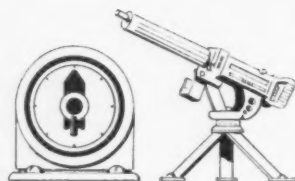
Nevada: Construction of a milling plant to produce 150,000 tons of manganese metal and a hydro-metallurgical plant to produce 291,000 tons and an electrolytic manganese plant to produce 12,000 tons, all at Las Vegas.

New Mexico: Construction of a 17,500 ton capacity manganese plant at Deming with mining operations in this district.

Airplane

Each week finds additions to the roster of new plants going into operation in the Los Angeles area in the important task of manufacturing parts for the aircraft industry. Aircraft producing plants are essentially assembly units and hundreds of specialized plants in southern California are acting under sub-contracts as suppliers. The situation is somewhat analogous to that of the early automobile days at Detroit though aircraft plants could not begin to produce the thousand and one gadgets which go to make up an airplane—from rivets, bolts, clamps to sheet aluminum. There is plenty of room for more suppliers who can manage to get into business, aircraft men assert. There are some 350 of these firms serving half a dozen large aircraft plants. According to Jack Frost, executive secretary Aircraft Parts Manufac-

from thermostats
to
machine gun mounts



A California firm recently switched its output from thermostats and gas heater regulators to machine gun mounts—a dramatic conversion taking place practically overnight. No less dramatic and swift was the financial aid, a Security Defense Loan, made available to this company. Speed is the order of the day. In defense financing, "Security stands for Speed."

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Member Federal Reserve System
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turers Association: Employment by parts suppliers may now run as high as 30,000; monthly payroll exceeds \$3,000,000; and aggregate backlog exceeds \$50,000,000.

Tin Can Substitutes

Of particular interest to the huge food-stuffs and canning industry of the Pacific coast are the views on the outlook for use of tin cans of R. P. Cooke, *The Wall Street Journal* staff member after making a survey of the situation. If you are worried by the new WPB order restricting tin cans, have another think, for its bark is worse than its bite.

In fact, you can sit down and make out a case on paper showing that current conservation moves, plus tin actually on hand, potentially gives the country four or five years' supply, writes Cook. As to pantry shelf supply, there will be a loss in variety rather than in quantity of the canned food available this year.

Facts developed by the survey are:

"In the first place, the '40 per cent reduction' in the amount of tin available to can makers does not mean a reduction of 40 per cent in volume of business and the prohibition against using tin cans for certain products does not mean those products won't be packed in cans. What will be gone is the tin.

"For instance, this reporter has just seen several different types of cans for motor oil: They are made of black plate (the basis steel sheet used in all tin can manufacture) with a quite satisfactorily soldered side seam (it used to be thought that black plate side seams couldn't be soldered). Some producers are contemplating a 'doped' side seam, eliminating all solder.

"In other words, many oil cans can and will be sold, as before, and with the outside lithography covering the secret of the dull, non-tin surface, the consumer will be just as happy and his auto engine will run just as well (if he still is operating one). There are a lot of other dried or non-food products on the proscribed list which also may be packaged in black plate—to which end various lacquers will help a good deal in working out the ways and means.

Oil Industry Task

Oil production is now at an all-time high. California remains in top position of the oil-producing states. We have the natural resources and plants for processing. *Transportation is the acute problem.* Outlined by *The Lamp*, published by Standard Oil Co. of New Jersey are the outstanding problems of the industry: (1) maintenance of a transportation system adequate to meet combined war demands and civilian needs. (2) Increase by three times the present production of 100 octane aviation

gasoline. (3) Multiplication of the production of toluene for manufacture of TNT. (4) Production of the principal raw materials for the manufacture of sufficient synthetic rubber to tide over the emergency during which imports are cut off. The task of the oil companies is a huge one.

Agricultural Priorities

Food production is one of the most important industries on the Pacific coast and is being called upon to produce not only for our own needs but to supply vast amounts for lend-lease uses. Farmers and agriculturalists may now take their equipment to any machine shop for repairs, it was announced in late February, *probably one of the most important priorities regulations that has come out of Washington since the war began.* P-100, the maintenance and repair order has been revised so that all repair and small machine shops may repair and maintain agricultural machinery under an A-10 preference rating. This applies also to purchase of repair parts where a farmer does his own repairs. Welding rod and other perishable tools may also be secured.

Northwest Coke

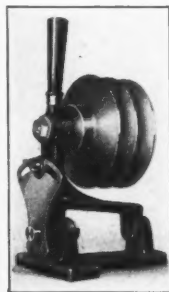
It is indicated that plans for a \$2,000,000 coke-producing plant to supply local industries and to be located in Tacoma, Wash. have been completed. Announcement of the project is expected shortly. It is claimed that ample coke-making coal supplies are available in nearby Pierce, Wash. county.

Aircrafters' Problem

The problem which is now foremost in the minds of aircraft officials of the Pacific coast is that of insuring continued transportation to plants of thousands of workers now that tire rationing restrictions are in effect. Pacific coast factories produce upwards of 60 per cent of all the aircraft in this country. *Their problem of transportation is entirely different from that of eastern aircraft production centers such as Baltimore and Hartford, Conn.* Here on the Pacific coast, the aircraft worker relies mainly on his jalopy to get him to work. This is particularly true in the Los Angeles area where such producing plants at Santa Monica, Inglewood, and Burbank are 15 to 20 miles distant from population centers. These communities are served by bus lines. Boeing Aircraft at Seattle, five miles distant from the city center, has its problem. The new plant at Renton will be further removed.

Last month, aircraft officials were worried. They were working on the problem but had no solution worked out. Boeing toyed with the idea of running trains from the city for employees. The tracks were there but no rolling stock was available.

Acting to get the facts in the case, Lockheed Aircraft with several plants in the Burbank area last month sent a questionnaire to each and every employee seeking information as to transportation used and condition of tires on individually owned cars. With this information in hand, Lockheed will know just how serious the situation is. It will then seek government and civic officials' aid in securing adequate buses. Lacking this, Lockheed officials plan to go direct to Washington for a solution.



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WESTERNERS AT WORK



FRANK McLAUGHLIN
Puget Sound Power & Light

A SURVEY of the western United States covering the past decade would show that few business or industrial executives have been busier than Frank McLaughlin, president of the Puget Sound Power & Light Co. With headquarters at Seattle, this utility radiates into 19 counties of western and central Washington and serves some of the most vital defense projects in the United States. Among these are the mammoth Boeing Aircraft plants, the Puget Sound Navy Yard at Bremerton, the big Tacoma smelter and a host of like enterprises of similar naval and military significance.

It is noteworthy that years before war became a reality, McLaughlin was an earnest and vocal advocate of adequate national defense. For the past eight years he has been Washington state chairman for the observance of Navy Day and is now a regional vice president of the Navy League of the United States.

McLaughlin's speeches and writings are distinguished by their frank and courageous support of the private enterprise system and defense of this system from socialistic attack. He speaks of his own company as "a product of free enterprise dedicated to the defense of America" and records himself thus in speaking of the present crisis: "The people who will bring America through to her higher destiny will be the same kind of men and women who carved the nation out of a wilderness and made her either the admiration or envy of the world. They will be people devoted to the cause of liberty, animated by the spirit of freedom, and schooled in the value of cooperative effort."

In the Puget Sound power area the question of "so-called" public power versus private power long has been a serious and often bitter issue. Throughout it all McLaughlin has been calm but positive and even his severest critics recognize the virtue of his sportsmanship and good humor. Commenting on the program of public utility districts for taking over his company's properties by condemnation, he says:

"In this wartime crisis, I feel that it is a tragedy of vast proportions even to contemplate condemnation proceedings, which would tear apart the unified, interconnected system of the Puget Sound Power & Light Co. which is so essential in this hour of national emergency and peril."



T. E. MANWARRING
Assumes New Post

W. I. COLE, vice president of the Owens-Illinois Pacific Coast Co., nationally known glass and corrugated paper manufacturers with Pacific coast plants in Oakland, Los Angeles and San Francisco, last month announced an important shifting of personnel which involved promotion for two executives. T. E. Manwarring, formerly assistant branch manager at Los Angeles, has been made assistant manager of the company's San Francisco sales office. Manwarring is well known in southern California packaging circles, and has held the office of assistant branch manager there for the past year.

Leland S. Connick, assistant manager of the San Francisco branch, was transferred to Los Angeles as manager of the sales office in that city. Through long association with the company, Connick is well known in San Francisco bay area cir-

cles. Prior to his appointment to the San Francisco office, Connick had been manager of the Oakland branch.

In Government Work

Loaned to the War Board by the Bonneville Administration for the duration, Barclay J. Sickler of Portland has been named Chief of the Priorities section branch of the WPB. Word of the new important position came through from Washington late last month. Since 1939, Sickler has been chief of the Rate and Statistics section of the Bonneville Administration.

Heads Steel Plant

ANNOUNCED last month was the appointment of H. J. Bauman as general manager of the Cold Finish Steel division of the Pennsylvania Iron & Steel Co., located at Los Angeles. The announcement was made by Samuel Tuch, president, when he said that his company had installed the first cold finish bar mill west of the Chicago industrial area. Bauman formerly was superintendent of the Keystone Drawn Steel Co. and vice president of the Empire Finished Steel Co. of Newark, N. J. He brings to his new job 25 years of specialized experience in mechanical, operating and supervising work within the steel industry. The new plant comprising 40,000 square feet of floor space and involving an initial investment of \$250,000 is now in operation supplying the needs of aircraft, oil tool, shipbuilding, armament and metal working industries in the Los Angeles area.



H. J. BAUMAN
Recently Appointed Manager



ISAAC M. LADDON
Noted Aircraft Designer

IMPORTANT step announced by Harry Woodhead, president of Consolidated Aircraft Corp. was the appointment of Isaac M. Laddon as executive vice president and general manager of the company's two huge plants which are producing bombers for military needs. Laddon, noted aircraft designer, has been associated with the industry since 1917. The first all-metal plane constructed in this country is claimed as his design. He joined the Consolidated organization in 1927 and recently has been vice president and works manager. He is credited with much of the engineering and production progress made by Consolidated over the past several years. Laddon designed the first practical airplane brake installation and holds several patents on airplane wheels, brake controls and complete airplane designs. He is a fellow of the Institute of Aero Sciences and a member of the Society of Automotive Engineering.

HENRY L. HARVILL
Airplane Parts Manufacturer



Produces Plane Parts

IMPORTANT announcement to the aircraft industry recently was that the Harvill Aircraft Die Casting Corp. made available to all other parts manufacturers its machinery and processes for producing high-grade precision-like metal dies. The outstanding success achieved by Henry L. Harvill, owner, engineer and manager of the company which bears his name started back in 1929. In a small tin garage in Los Angeles, a new method of high speed production of lightweight, high strength die casting was in its development stages. The following years saw rapid strides toward achieving a goal which today has evolved a production

technique that is a vital factor in speeding production of high precision light metal parts for the aircraft industry.

Today, the firm probably has the largest battery of high pressure die casting machines under a single roof in this country. Through the technique developed by Harvill, aluminum and magnesium alloy die castings are taking the place of slower to produce sand castings. They are eliminating the slow and costly hand-machining operations required with sand castings. The basic principle unique in the Harvill process is the use of super high-pressure during the injection of the molten alloy into the die cavity, claimed as giving greater tensile strength.

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RETAIL LUMBER

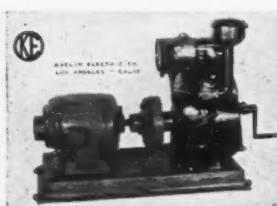
RETAIL lumbermen from six northwest states met last month at Spokane and sat down for a thorough round-table discussion of industry problems at the annual convention of the Western Retail Lumbermen's Association which started February 18. Aside from winning the war, delegates were not unmindful of post-war problems, agreeing that the problem of the future is that of utilizing the huge manufacturing capacity for peacetime civilian use. Delegates had in the mind, as stressed by one speaker, that "we are not only in-

creasing beyond all previous conception the manufacturing capacity of our existing plants, but are continually expanding our total output through widespread construction of new plants."

Dr. Clarence D. Stone, wood technologist of I. F. Laucks, Inc., Seattle glue manufacturers, cited the Aluminum Co. of America as an example of an industry faced with the task of finding markets in a post-war period to take up the vastly increased light metal output. He quoted their coined word "imagineering"—imagination plus engineering—as a formula for the future. Reynolds Metals Co. has a Northwest aluminum plant.



CLARENCE D. STONE
Wood Technologist



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BUSINESS BOOKS

Mining Supply Directory, containing 246 commodities used in mining and the names of 500 manufacturers producing them, listed for owners and operators, aimed at creating new markets for southern California products. The book covers mining and milling machinery, equipment, supplies and services. Issued by the Los Angeles Chamber of Commerce.

Electric Lifts, a practical treatise on the construction, operation and maintenance of the chief types of electric lifts, namely, A.C., D.C. and A.C./D.C. lifts. Considerable space is devoted to the subject of lift control, and special attention has been paid to the system of control by variable voltage. Many practical wiring diagrams together with useful photographs of modern equipment also are given. The book should prove useful not only to the consulting engineer and contractor who may have occasion to specify or install electric lifts, but also to the maintenance engineer who is responsible for keeping these lifts in effective service. Leather bound, 230 pages. Price, \$2.50. *Chemical Publishing Co., Inc.*, 234 King St., Brooklyn, New York.

"Training Oxy-Acetylene Welding and Cutting Operators—Instructors' Outlines" was prepared primarily to assist instructors in planning courses for the training of oxy-acetylene welding and cutting operators.

An introduction describes in considerable detail the organization of the book and gives suggestions for its use. Paper-bound copies, 25c; de luxe cloth bound copies, 75c. *International Acetylene Association*, 30 East 42nd St., New York, New York.

VIEWPOINT

Readers are invited to give their views and exchange ideas through the medium of the editorial columns of Western Industry. Additional information relating to subjects of articles can be obtained by writing the Editor, using business letterhead if feasible.

Dear Sir: The articles in *Western Industry* make interesting reading, and I particularly like the new format of the January issue. Thank you for your expression regarding my appointment on the Central Valley Project.—Chas. E. Carey, Senior Engineer, Bureau of Reclamation, Sacramento, California.

Dear Sir: Congratulations on your enlarged magazine. It's always full of interesting information. Would appreciate your sending me some pamphlets which have been listed as available in your magazine. Samuel E. Gruber, Los Angeles, Calif.

Dear Sir: Congratulations on the Colorado and Rocky Mountain article in the February issue of your magazine. It was extremely well written, and presented a clear picture of the situation as it now exists. Too, it quite possibly gives an accurate prediction of the future. If this department can ever be of service to you in the matter of research, pictures, or information, please let us know.—Robert E. Warren, State Director of Publicity, Denver, Colo.

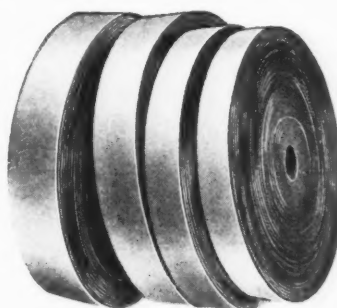
Dear Sir: In your February 1942 issue, Volume 7, number 2, page 9, in the right hand corner, you mention lignin, by-

product of wood pulp. We have been interested in this product for the last two years. We have been trying to get some information about who produces it for commercial use and where we can buy it. We shall be glad if you will give us all the information about it. Thanking you in advance.—Meyer Greitzer, No-Mar Chair Seating Co., Los Angeles.

Your inquiry concerning the production of lignin has been referred to the writer of the article which was carried in the February issue—Arnold Kruckman, our Washington Representative. We also have referred your inquiry to R. S. Hatch, Director of Research Laboratories, Weyerhaeuser Timber Co., Longview, Wash.—Ed.

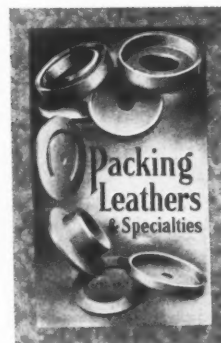
Northwest Fuel

Disclaimers to the contrary, there is an acute situation with respect to fuel oil supplies in the Pacific northwest. This also applies to gasoline. The enemy raiding submarines which were active for a time in early February touched off the situation when tanker shipments were curtailed. Now there is a scarcity of tankers. Southern California oil executives are making strong representations to Washington for the return of a portion of the Pacific tankers which were diverted to other runs. They are none too hopeful. Recently home owners using fuel for heating were informed by radio broadcast where to set their temperature gauges.



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CALENDAR OF EVENTS

- March 2-4—PACIFIC STATES BUTTER, EGGS, CHEESE & POULTRY ASSN., Regional Conference, Portland, Oregon.
- March 12-14—NORTHWEST FLORISTS ASSOCIATION, Regional Conference, Portland, Oregon.
- March 10—AMERICAN PETROLEUM INSTITUTE, Regional Conference, Biltmore Hotel, Los Angeles.
- March 12-14—TRUCK OWNERS ASSOCIATION OF CALIFORNIA, Convention in Oakland, Calif.
- March 19—ROCK, SAND & GRAVEL PRODUCERS ASSN. of Northern California, Convention in San Francisco.
- March—CALIFORNIA PUBLIC SCHOOL BUSINESS MANAGERS, Hotel Del Coronado, Coronado.
- March—RETAIL PETROLEUM DEALERS ASSOCIATION, State Convention in Los Angeles.

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LUMBER MEET

THE United States Army last year was the largest single customer for the products of the country's lumber mills. And so, it was only logical that a ranking representative of the War department should be principal speaker before the annual meeting of the West Coast Lumbermen's Association held at Portland, Ore., starting January 30. Col. W. D. Styer, C.E. and executive officer representing Major General Eugene Raybold, chief of engineers, U. S. A., made the principal address as the official representative of the War department.

The West coast lumber industry received a pat on the back when the War department representative told them that there was no bottle-neck in their industry; that the industry had come through with the material for the important task of Army construction. They were told that "You did not need to tool up . . . To paraphrase a familiar saying, 'You delivered the woods'."

Pertinent facts relating to operations and production last year: the West coast lumber industry consistently exceeded the figure of total industry rated capacity excluding holidays and strike periods, the excess in some weeks being as high as 20 per cent; final figures will show that the industry on the Pacific Coast showed the greatest output since 1929 establishing another record 10 billion board feet of output; national consumption of lumber in 1941 was estimated at 32 billion board feet. The direct and indirect application of lumber to defense jobs—Army, Navy, shipyards, aircraft, boxes and crates, defense



COL. W. D. STYER
Discusses Army Needs

housing and plants, defense construction on railroad equipment and farms last year consumed 24 billion feet or 73 per cent of the total lumber output.

On the controversial subject of depletion, Corydon Wagner, retiring WCLA president and vice-president of the St. Paul & Tacoma Co. of Tacoma, told the conference that "after 60 years of logging on the West coast, we have about half of our forested area still uncut. It is estimated that 70 per cent of the area previously cut over and classified as forest land is restocking. The over-all picture is reassuring." WCLA members elected Orville Miller of the Wuana Lumber Co. of Wuana, Ore., as new president for the coming year.

Nisqually Plant

Bids will be received on March 16 by the City of Tacoma for the construction of two concrete arch dams, two power houses, including an addition to an existing power house, a 1 1/4-mile tunnel, steel and concrete surge tank, and steel penstocks, which will comprise the second Nisqually power development project. The entire development is estimated to cost \$11,000,000, and construction will be financed by the sale of revenue bonds, of which more than two-thirds have already been sold. The project is located on the Nisqually River, about 30 miles southeast of Tacoma, near the towns of Eatonville and Elbe.

Manganese

Construction of \$4,500,000 manganese concentration plant to be operated under government supervision by the Manganese Ore Co. of Cleveland, Ohio, was reported from Las Vegas, Nevada. Local engineers said that the Three Kids ore deposit, located approximately 15 miles southeast of Las Vegas, has been extensively drilled and tested by the U. S. Bureau of Mines, and is indicated to contain about 500,000 tons of commercial ore, available for steam shovel mining.

ACCIDENT FREQUENCIES

(Continued from page 11)

in need of improvement as compared to established good practice for the industry in question.

Industry	Frequency
Cement	10
Printing and Publishing	10
Steel	10
Laundry	10
Automobile	10
Chemical	10
Machinery	10
Glass	10
Rubber	10
Textile	10
Non-ferrous metals	10
Meat packing	15
Sheet metal	15
Quarry	15
Misc. Metal Products	15
Public Utility	15
Petroleum	15
Transit	15
Clay products	20
Paper and Pulp	20
Food	20
Tanning and Leather	20
Woodworking	20
Foundry	20
Refrigeration	20
Construction	20
Mining	20
Lumbering	20

(Continued on next page)

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Frequency rates answer the question "how often," but they tell us nothing about "the seriousness of the injury." Going back again to the "smoke-filled" room we find that the committee decided to use the time loss of the injured worker to measure seriousness. Severity is the time loss in days per thousand hours worked. Expressed as a formula, it is:

$$S = \frac{\text{Days lost} \times 1,000}{\text{Man-Hours Worked}}$$

If in the example cited above the 10 injuries involved the loss by the injured workmen of 200 days' time, the severity would be:

$$\frac{200 \times 1,000}{200,000} = 1$$

Suppose, however, that one of the injuries involved a permanent disability—say, the loss of two fingers. Obviously, the time required for the injury to heal is not an adequate measure of its seriousness. Therefore, a schedule of time charges was agreed upon for all permanent injuries. (See table below.) For two fingers the charge would be 750 days, which, added to the actual time loss of the remaining 9 injuries (we will assume that to have been 180 days) gives a total of 930 days and the severity rate becomes:

$$\frac{930 \times 1,000}{200,000} = 4.65$$

(Note that the time charges for permanent disability are in each case presumed to include the actual time loss while the injury is healing.)

In practice, severity rate is a much less usable gauge of safety performance than frequency rate because it takes too long (we hope) to accumulate enough injuries for the law of averages to apply. Severity rates, based on less than about a thousand lost-time injuries, are very unreliable in determining the relative seriousness of injuries as among the various industries. Chance plays too big a part for it to be otherwise. "But for the grace of God" almost any accident occurrence might be very serious or fatal. For instance, a stair has one low riser. Two persons miss their footing. One catches himself and suffers only a strained finger. The other falls headlong and dies of a fractured skull. Those two accidents could easily have been included in the 10 in the plant cited above. The inclusion of the death would have upped the severity rate to 30.9. Obviously then, severity rates, while useful as supporting evidence, should not be taken as indicating the degree of hazard existing in any given establishment. When applied to entire industries and based on thousands of injuries, they are valuable indicators of the seriousness of injuries to be expected from each industry.

For instance, again comparing the laundry and the cement industries, the severi-

STANDARD TIME CHARGES FOR PERMANENT DISABILITIES

Disability	Time Charges in Days
Death	6000
Permanent total disability.....	6000
Arm, at or above elbow.....	4500
Arm, below elbow.....	3600
Hand	3000
Thumb	600
Any one finger.....	300
Two fingers, same hand.....	750
Three fingers, same hand.....	1200
Four fingers, same hand.....	1800
Thumb and one finger, same hand.....	1200
Thumb and two fingers, same hand.....	1500
Thumb and three fingers, same hand.....	2000
Thumb and four fingers, same hand.....	2400
Leg, at or above knee.....	4500
Leg, below knee.....	3000
Foot	2400
Great toe or any two or more toes, same foot.....	300
Two great toes.....	600
One eye, loss of sight.....	1800
Both eyes, loss of sight.....	6000
One ear, loss of hearing.....	600
Both ears, loss of hearing.....	3000

ties were .05 and 2.46 respectively. In other words, the frequency of injuries in the laundry membership of National Safety Council was slightly greater in 1940 than in the cement industry, but the seriousness, measured by the American Standard formula for severity was 40 times as great for cement as for laundry. That indicates a high proportion of fatalities and serious permanent disabilities in the cement industry.

Each management—each plant executive—should keep firmly in mind that he has ready to hand in his frequency rate a barometer of safety that if he keeps it in view will show him what the safety weather

in his plant is like. If the reading is 10 or less, the sun is shining and the birds are singing and the golf course beckons; but if it rises to 20 or 30, the air is chill and the only bird in sight is a crow. If it gets much higher, vigorous action is called for. The plant is definitely unsafe and shouldn't be operated under such conditions.

Tin Restrictions

In early February, WPB took away half of the tin that formerly went toward packaging a wide variety of food, including beer and dog food. The process of restriction moved on last month and a new order means less tin in tin cans.

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WAR CLINICS

HERE on the Pacific coast, the war production clinics (now permanent exhibits of things needed by the armed forces) are eminently successful. After a month tryout, it is shown that they are achieving excellent results in bringing small manufacturers to war work by showing them what is needed. One firm, manufacturing "totes" for race tracks, for instance is now making valves for the Bethlehem Shipbuilding Co. of San Francisco, major prime contractor. Officials of International Totalizer Co. of San Francisco, threatened with extinction visited the San Francisco exhibit. Result, a contract to keep them busy.

Interest in the exhibits was stimulated by designated certain days for particular cities or areas such as "Sacramento day." Permanent exhibit which started February 2 at the Whitcomb hotel, San Francisco, has been well attended since. More than 2500 parts and completed items from 35 prime contractors are on exhibition.

Serving the southern California area, the permanent exhibit is located in quarters provided by the Los Angeles Chamber of Commerce, 1151 South Broadway. The Quartermaster Procurement Planning exhibit displays scores of articles needed—clothing, shoes, boots, kitchen equipment,



• Between 500 and 800 visitors each week are attending the permanent exhibits or clinics available in larger Pacific Coast cities to show plant management what is needed and suggest means for plant conversion to war work. Pictured above is a section of the Los Angeles war exhibit.

skins and snowshoes, knapsacks, and other army equipment needed.

Major Harley A. Dresbach, USA, in charge of the two exhibits said that a manufacturer with wood-working facilities was interested in making army cots. At the San Francisco clinic he met another who could produce metal parts. A third who can produce canvas is being sought, when the trio can get together and make a substantial bid for army cots. Another instance of cooperation—the owner of the Rogers Garage of Willets, Calif., observed a running gear on a tank truck which he figured his idle machinery could turn out. He was quickly put in touch with the Victor Equipment Co. of San Francisco which needed gears of this type.

(Continued from page 7)

Not likely to meet with approval from Jesse Jones, RFC, is Ickes' proposal "to break a bottleneck of securing capital." The Interior Department should be "given authority to certify to the RFC for loans to companies or individuals seeking to develop low grade ores or construct mills or smelters for the production of war materials." *This certification shall be construed as an obligation on the RFC by amendments to the present RFC acts.*

Secretary Ickes has assured us that he will forward later, a draft of "mineral and power development legislation in accordance with Senator O'Mahoney's request" intended to break the "financial bottleneck."

New Plastics Plant

Western Plastic Co. of Los Angeles has leased an industrial plant site at San Bernardino, Calif., reporting that a crew of 50 workers will start fabricating operations for the new plant at once. Lacking confirmation, it was reported that the new plant, when completed, will manufacture small boats, probably for use as "mosquito" units.

Sugar Factory

If work proceeds satisfactorily and as planned, completion of the \$2,000,000 Amalgamated Sugar Co.'s new plant at Nampa, Idaho, may be expected by October 1, 1942, according to W. I. Hodge, construction engineer. The brick work has been completed, it is reported, and contractor J. T. McDowell has started work on the reinforced concrete 200,000 bag bulk storage plant in which part of the output of the factory will be stored.

Chemical Units

Two new plants were reopened last month in central California located on the Tidewater-Southern line of Western Pacific Railroad Co., tying in with the production program of the Chemical Warfare Board. Plant of the Chemurgic Corp., located at Chemurgic near Turlock, Calif., went into operation. Plant of the Ferro-Enamel Corp. of Modesto, Calif. was reported as getting into production.

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LABOR—FROM LEFT TO RIGHT

SPORADIC labor disturbances were in evidence up and down the Pacific Coast last month. Short-lived, they caused no appreciable stoppage of war production work, probably due to the fact that picketing became very unpopular. Workers at various plants which were involved from time to time going about their jobs showed open hostility to many of the picket lines. At Seattle, for instance, open violence took place at the shipyards when the picketers were driven away by some workers.

Welders Walk Out

Officially, the "strike" called by the Welders Union over its jurisdictional dispute involving clarification of their status with the AFL continued in effect during the past month. Consensus, at the month-end, was that the strike, which was unpopular even among the workers, had died a natural death. The workers gradually drifted back to the plants in Seattle, Tacoma, San Francisco, and Los Angeles. The walkout was most pronounced in the Northwest, at Seattle and Tacoma, where shipyards for a short while were affected.

Eye Trouble

Hearing before the State Industrial Accident Commission started last month on the compensability claims of scores of workers employed at the Bethlehem Steel Corp. shipyard at San Francisco. Many workers were suffering from eye infection which California State Federation of Labor, representing the claimants, alleged was due to unsanitary conditions. Company representatives testified that the eye malady was of an epidemic nature, non-occupational in character.

Store Strike Ends

Ending a six-month old fight which started early in September, the San Francisco department store strike ended February 18 when the Retail Department Store Employees Union, local 1100, AFL, signed agreements with the stores involved, but without gaining their demand for a closed shop. The principal issue in the dispute was the demand for a closed union shop which the clerks described as a "union store contract." The retailers' council acted for the three stores involved,—The Emporium, J. C. Penney Co., and Sears, Roebuck & Co.

The agreement provided that wage demands of the clerks, as well as those of the janitors' and elevator operators' unions, which have been involved, will be negotiated for a thirty-day period, and if no agreement is reached, the questions will be

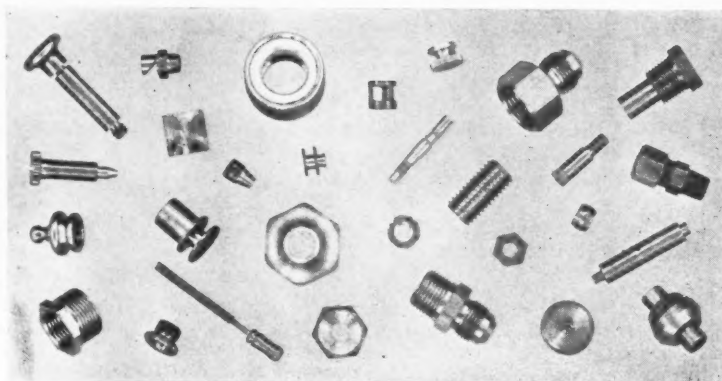
arbitrated. Details of the agreement were outlined in a joint statement by Almon E. Roth, president of the San Francisco Employers Council and State Senator James F. Shelley, president of the San Francisco Labor Council.

Longshoremen

Following the end of hearings held in Washington before the War Labor Board, members of the AFL Longshoremen's union in the Northwest were awaiting a quick decision on their claim for a \$1.50

per hour rate for longshoreman work. The AFL union holds bargaining rights under a NLRB decision to represent longshoremen at three Pacific Coast ports—Tacoma, Anacortes, and Port Angeles, Wash. Union demands were presented last fall, and the government ordered a survey held of the ports involved to determine whether the demands were warranted. Any decision to increase the present \$1.00 longshoreman hourly rate would have important repercussions in other Pacific Coast ports, practically all of which are CIO controlled.

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GROWING PAINS

LAST chapter on the months-old controversy as to the location of aluminum fabricating plants on the Pacific coast was written last month when application was filed for a building permit to erect a \$40,000,000 rolling mill at Trentwood, Wash., eight miles east of Spokane. Result—both Los Angeles and Fairview, Ore., (the latter near Portland) lose the projected \$20,000,000 plants set for their respective areas while the two rolling mills will be combined for the Washington site. Reason—another step in the government decentralization program which seeks to place new vital war industries away from the seacoast area. Defense Plant Corp. which supplies the funds has the last word on plant locations.

Government policy still lacks clarification—apparently each individual plant location is viewed on its own merits. Government policy, still vague, is apparently to have plants inland at least 200 miles away from the seacoast. At least this has been unofficially intimated to various persons and service agencies here on the Pacific coast. In the case of the projected rolling mills for the Portland area, work had actually been started early in December—ground breaking and grading—and ordered discontinued within a few weeks.

Vital need on the Pacific coast is the erection of fabrication mills for processing aluminum metal. Mills for rolling sheet metal are needed to supply Pacific coast aircraft plants. With the exception of the Aluminum Co. of America plant producing a limited amount of aluminum castings in the Los Angeles area, we have no fabricating plants on the Pacific coast. Now, aluminum ingots produced in the northwest from ore mined in Dutch Guiana and Arkansas, must travel to mills east of the Mississippi to be rolled into sheets, and then come back to supply Pacific coast aircraft plants.

Building permit for the area project was filed by a representative for the United Engineering & Foundry Co. acting for the Defense Plant Corp. Preliminary plans indicate a processing capacity for the new mill of 240 million pounds annually, largest of any plant in the world and 60 million pounds more than the combined output of the two plants eliminated.

Western Flax

War has cut off imports of line-flax from Europe and flax products have become critical materials. Washington and Oregon, it is declared, have great acreage suitable for flax-growing and only hindrance to promotion of a large flax culture in the northwest is necessary priorities for construction of processing plants. Declared as successful is a cooperative at St. Paul, Ore., where a processing plant has been in operation since last spring. Cooperative members say that cost of the processing plant will be paid out in one year's operation, with a profit besides. Half a dozen cooperative plants are in operation in western Oregon. Backers assert that flax-growing can become a major permanent industry of the northwest.

Synthetic Rubber Units

From Washington, D. C. came word that the Reconstruction Finance Corp. had approved a \$25,000,000 loan for the construction of three plants in Los Angeles, capable of producing 30,000 tons of synthetic rubber annually. This was part of the project outlined by Jesse Jones, RFC Administrator who plans a series of synthetic rubber plants scattered throughout the country to supply the loss of the product which came from Malaya.

The synthetic rubber producing factories will be constructed in the Los Angeles area by Bechtel-Parsons-McCone, contractors, to be operated by the Kaiser

Co., Inc., of Oakland. Two factors probably motivated the decision to allocate these plants in the Los Angeles area: (1) Los Angeles now is a major rubber products producing center, second only to Akron, Ohio, in output. (2) Ample petroleum and by-product supplies are available here, as the city is the center of production and refining operation of the southern California industry. Petroleum and its by-products are used largely in the manufacture of synthetic rubber.

The Kaiser group of Oakland, which already is interested in Pacific coast shipbuilding and operates the magnesium plant at Permanente, Calif. has promised the government that the new plants will be in production by the end of this year.

Oregon Plant Site

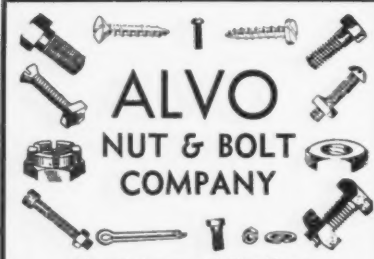
Possibility of a new industry to utilize the site abandoned when the projected aluminum rolling mills for Fairview, Ore. were transferred to Spokane was indicated when the General Electric Co. men there were told to halt removal of power lines installed for temporary service during the construction of the plant. Unconfirmed report in Portland was that a new industrial development to utilize the site was being discussed. The orders to halt removal of the temporary power lines were understood to have come from the Defense Plant Corp. officials at Washington which is financing the aluminum plants.

Reopen Woolen Plants

Plant of the Eureka Woolen Mills of Portland, Oregon, which had been idle since the spring of 1940 again will be operating very shortly under the direction of Norman Rothstein, who has taken a lease on the property with an option to buy. It was reported that orders for manufactured goods are on hand from the government and from private sources which shortly should enable full-time operations.

New Sawmills

Purchased by the American Box Corp. of virgin timber on 5,200 acres near the Northfork in the Sierra National Forest, estimated as providing 86 million board feet was reported from Fresno, Calif. last month. Plans contemplated the establishment of a sawmill near the timber source with trucking operations carrying the lumber to the company's manufacturing plant at Fresno.



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Insulating Material

The first perlite plant in the world, introducing a new insulating material to be used in modern building construction, will be in operation in Las Vegas soon, according to the owners, Thomas T. Schofield, R. J. Saylor, O. M. Simpson and A. W. Blackman of Las Vegas, and A. L. Stone of Los Angeles.

An unlimited supply of the raw material has been discovered about ten miles south of Jean and only four and one-half miles from the Union Pacific railroad. Perlite, a volcanic glass, when it is exfoliated will expand 10 to 20 times its original size, it is claimed.

Schofield reports that the insulation value of perlite is 22 per cent higher than any known material, is sound proof and vibrations do not pass through it. The material will float on water, and so far in his research work, Schofield reports, no acid or water has been found to penetrate or affect the material.

New Tube Plant

Plans for early construction of \$350,000 plant to be located at Ontario, Calif., 30 miles southeast of Los Angeles, and to manufacture seamless steel tubing, were announced late last month by Frank Russell of Russell Products, Inc., of Los Angeles. Russell's announcement followed OPM approval of the Ontario site and an allocation of funds by the Defense Plant Corporation to cover cost of the new plant. Considerable significance is attached to the selection of Ontario as a plant site as this community is situated in the heart of the citrus belt, and is activities are mostly agricultural.

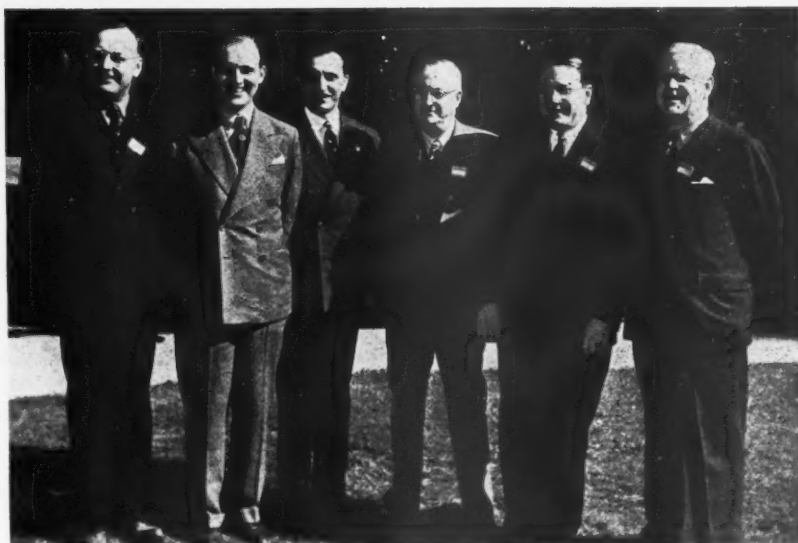
Chromic Oxide

Production of chromic oxide from black beach sands of northern Curry county, Oregon is the goal of a \$500,000 plant for which construction will begin soon, according to an announcement made by the Crome Corporation. W. G. Hellier of Santa Cruz, Calif., will be resident general manager.

The open pit method of mining will be used. The dirt overburden will be stripped from the black sand, then power shovels and carryalls will take out the heavy sand and convey it to the concentrating plant. The concentrate will be taken by truck to a government stockpile, tentatively scheduled for establishment in Coquille, Ore.

Tacoma Aluminum

At Tacoma, Wash. last month work was under way grading to start construction of the new \$6,000,000 plant to produce aluminum from an entirely new process to use alunite. The new plant which should be completed this fall is designed to produce 46 million pounds of aluminum annually



• Attending the 18th Annual Conference of the Iron, Steel & Allied Industries at the Del Monte Hotel, Del Monte, Calif., reading left to right were: C. B. Tibbetts, retiring conference chairman and vice president of the Los Angeles Steel Casting Co.; Roswell Whitman, chief iron-steel products division, OPA; Dr. S. S. Stratton, Chief, Technical Consultant Staff, WPB; H. M. Tayler, Tayler & Spotswood, San Francisco, newly elected conference chairman; James Mussatti, California State Chamber of Commerce; and Colonel F. M. Smith, State Manager, Contract Distribution Branch, WPB, San Francisco.

at this 146 acre site. The process has been developed by Kalunite, Inc. at a pilot plant at Salt Lake City. This is a subsidiary of the Olin Corp. headquarters at East Alton, Ill. which will operate the new plant. The process is declared a success and is the first time that alunite has been used to produce alumina. Ore from the Marysvale, Utah district, together with a percentage of bauxite which hitherto has been the sole source of supply will be used. Bauxite is mined in Arkansas and Central America.

Salt Lake Plant

Work is scheduled to start on Utah's \$3,000,000 alumina plant, to be built and operated for the Defense Plant Corporation by the Olin Corporation, Representative J. W. Robinson was informed by the RFC.


Previously, the plant was supposed to have been established either at Lehi or close to Provo because of the large supply of gas that will be available at those points when the new coke ovens to supply the pig iron industry go into operation. The shift to Salt Lake City probably means that the company will use natural gas.

Steel Conference


More than 300 iron and steel executives of the Pacific coast gathered at Del Monte, California, last month and had a chance to discuss industry problems under wartime conditions at the 18th annual conference of Iron, Steel and Allied Industries.

Outstanding topic of discussion was the important subject of enabling means to get small plants into production of war goods. The conference was sponsored by the California State Chamber of Commerce.

Col. Frank M. Smith, state manager, Contract Distribution branch, Production division, WPB, discussing the future for small plants warned that unless they get into war production business failure is staring most of them in the face.



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OPPORTUNITY SECTION—

Priorities regulations have made it practically impossible to secure new machinery for industrial operations unless a plant is doing 100 per cent work on war projects. Even then, long delays are in prospect. The government is urging full use of existing machinery. Listed below are "machinery opportunities" immediately available here on the Pacific Coast. Recently, used machine tools were made subject to priorities, but this does not apply to other classifications of machinery.

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- 3—10 K. V. A. General Electric
- 2—25 K. V. A. Westinghouse

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- 1—25 K. V. A. Westinghouse
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- 1—1150' 2-stage 100 lb. Compressor and Motor
- 1—30" double end Punch & Shear, heavy duty
- 1—360 HP 350 RPM 3-bearing 2300 volt slipring Motor
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- 1—10 x 12 3-drum Steam Hoist

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- 1—30 KW 125-Volt 240 Amps, Compound 3 bearing Westinghouse with 45 HP motor
- 1—16 KW 230-Volt 64 Amps, Compound 4 bearing Westinghouse with 25 HP motor and complete battery charging panel
- 1—5.25 KW 125-Volt 45 Amps, 3 bearing shunt Westinghouse with 8.4 HP motor and complete battery charging panel
- 1—7 KW 230-Volt 30 Amp, Compound 4 bearing Westinghouse with 10 HP motor

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- 1—200 H.P. G.E. Type I, 600 RPM, 440 volts.
- 1—200 H.P., G.E. 1800 RPM, 440 volt motor.
- 1—150 H.P. Westinghouse, Type CS, 1800 RPM, 440 volts.
- 1—150 H.P. Type B.F.M. 720 RPM, 440 volts.
- 1—150 H.P. Westinghouse, Type CS, 900 RPM, 2200 volts.
- 1—150 H.P. G.E. Type I, 720 RPM, 440 volts.
- 1—100 H.P., Slip Ring, G.E., 720 RPM, 440 volts.
- 1—75 H.P. Crocker Wheeler, 900 RPM, 440 volts.
- 1—62½-Ft. 25½-inch Double Leather Belt.
- 1—50 H.P. Westinghouse, 900 RPM, 440 volts.
- 1—50 H.P. Westinghouse, Type CS, 1800 RPM, 440 volts.
- 1—50 H.P. Vertical Fairbanks Morse, 1200 RPM, 220 volts, solid shaft.
- 1—35 H.P. Crocker Wheeler, 1200 RPM, 220 volts.

GENERATORS, BLOWERS, WATER PUMPS

- 1—600 Amp., Western Electric, 32 volt, 850 RPM, D.C. Generator.
- 1—300 H.P. Triumph Water Wheel with governor, 50 ft. head.
- 1—200 K.W. Westinghouse A.C. Generator, 900 RPM, 440 volts, 3 phase.
- 1—No. 70 ILG Blower, 17,430 CFM, direct to 6 H.P. 340 RPM, 3 phase motor.
- 1—75 KVA Transformers, Wagner Type HE, 6600 to 220/440/ volts, 60 cycle.
- 2—75 KVA Transformers, G.E. Type H, 6600 to 120/240/480 volts, 60 cycle.
- 1—50 H.P. Single Drum Mine Hoist.
- 1—20-inch Krogh Split Case Pump, 11,000 GPM at 26-ft. head.

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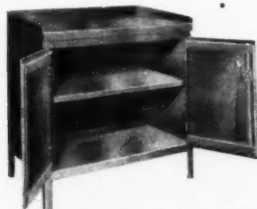
THE SHOWCASE

For more complete information concerning any of the products listed in these columns, write to 503 Market Street, San Francisco, and we shall see that the material is forwarded to you. The descriptions of the product and claims made are those of the manufacturer.

• **AUTOMATIC TYPEWRITER**—An automatic typewriter employing push buttons for the selection of form letters, special paragraphs in form letters, and for detailed order-writing and billing operations was announced recently. The machine has two banks of push buttons, one for each of two rolls from which letters or billing entries are transcribed, with 40 stations on each bank. The machine is actuated by two perforated paper rolls similar to music rolls, and the push buttons select desired information from each



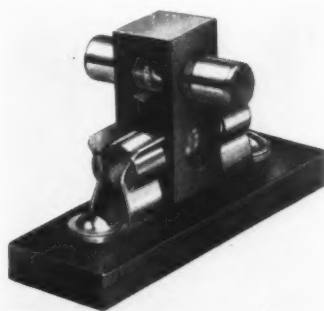
roll. Rolls are easily changed, making the machine easily available for work above its two-roll operating capacity. Each roll or stencil, accommodates 200 lines of type which may be divided into complete letters, paragraphs or groups of paragraphs, or into single or multiple line billing entries. American Automatic Typewriter Co., 614 No. Carpenter St., Chicago, Ill.



• **MACHINE TOOL CABINETS**—The machinist is offered a handy work bench-cabinet which features security and all-around usefulness. Heavy gauge working surface is ideal for small vises and grinders. Twelve square feet of enclosed storage area are protected by full swinging triple latch doors equipped with padlock hasp or built-in flat key lock. Center shelf is adjustable on 1½-inch centers. Lyon Metal Products, Inc., 33 Clark St., Aurora, Ill.

March, 1942—WESTERN INDUSTRY

• **FUSE-CHANGING**—An entirely new convenience for changing fuses in close quarters, replacing a blown fuse in a twinkling and giving notice on inspecting that another spare is required are features compactly embodied in a Spare Fuse Holder and Puller recently an-



nounced. These new devices are applicable to all 4 AG and 5 AG fuses. When the fuse in a circuit blows, all the operator has to do is to pull and reverse the holder. This puts the spare fuse in circuit and brings the blown fuse on top in the same position that the spare was in before. One end of the holder is painted red and is underneath, out of sight. When a reverse is made, the red is brought into full view on top, indicating that a fuse has blown and another is required. Littelfuse, Inc. 4797 Ravenswood Ave., Chicago, Ill.



• **ELECTRICAL CONNECTOR**—With this type ER connector, copper cable conductors can be joined on end, at angle or parallel to each other. It may also be used as coupler or reducer. Swivel design permits cables to be inserted into either eye from seven different angles and rigidly clamps them in that position. Each cable clamping element will accommodate a large range of conductors. Minimum and maximum sizes are gripped in connectors without any extending parts or exposed threads. Burndy Engineering Co., 463 East 133rd St., New York, N. Y.

• **PUNCH AND DIE HOLDERS**—New patented narrow compact punch and die holders were announced recently. These new models punch 3/16" maximum holes on a minimum center to center distance of 5/8" with shut height of 6¼". "Selective Stripping" provides three instantly removable and interchangeable springs

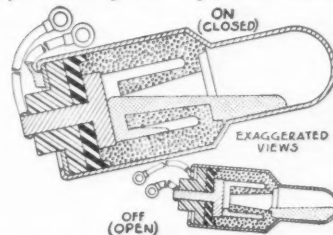
for a stripper selection of 1, 2 or 3 spring tension to custom fit the exact stripping action required by various gages and types of metals. In addition, nothing is attached to the ram of the press. Each individual unit may be reset or removed from the rail quickly. Free floating punches may be lifted out of their guides instantly. Even the punches, guides and springs may be removed instantly. Die-setting time can be cut from hours to minutes and presses kept in operation even when setting new patterns, according to the manufacturer. The Strippit Corp., 1200 Niagara St., Buffalo, New York.

• **HEAT LAMP**—A new type of infra-red heat lamp recently developed, has just been announced as the first commercial type of radiant heat lamp whose design and construction make possible and entirely practicable 100 per cent control of heating efficiency. The new bulb is distinguished by a ring lining of pure silver



sealed inside the bulb at a point just below the focal point of the filament, as illustrated. This silver ring makes the new "bull's-eye" type of Birdseye heat lamp, and is said to control "spilled heat rays" and to put them to work for heating even when present reflector equipment is utilized. By utilizing this extra 25 per cent heating value, the new type of bulb is said to make far greater heating efficiency possible. Wabash Appliance Corp., 335 Carroll St., Brooklyn, N. Y.

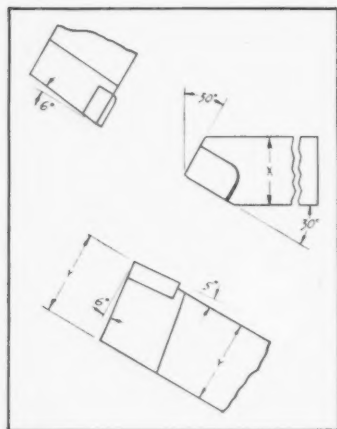
• **MERCURY SWITCHING**—According to the manufacturer, "Double-Flow" Mercury Switching has a peculiar character-



istic which occurs at the time of opening and again at the time of closing or rejoining of the two bodies of mercury. When

the large end tips slightly above level, the horse shoe shaped mercury pulls down on either leg, much as a rubber band would be pulled down across a sharp edge, so when the parting takes place, neither body can reach over and reconnect with the receding body opposite. This, it is claimed, definitely avoids double contacting so prevalent in all other mercury switches where vibrations occur just at the moment of operation. When the large end starts to tip back to the closed position, the two separate legs of the horse shoe crowd toward a common joining point, and the mercury in a long channel compresses the advancing points so when the two do meet, they become confluent with a level twice as high as they would have if it were but one moving body of mercury contacting a stationary body. Durakool, Inc., 1010 No. Main St., Elkhart, Indiana.

• **KENNAMETAL TOOLS** — A new standard series of Kennametal tools in large turning and facing styles for heavy machining was developed recently. The position of the tip in the shank (see illustration) permits a greater thickness of steel under the cutting point of the tip,

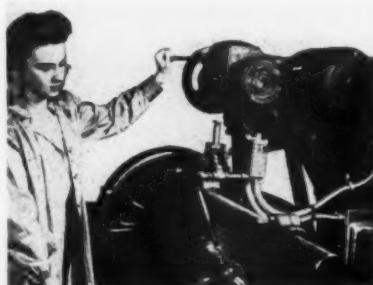


permits the top surface or chip breaker to be ground without the necessity of grinding away steel, and during the life of the tool, the height of the cutting point is retained rather than being lowered each time the tool is ground. McKenna Metals Co., Latrobe, Pa.

• **DEODORIZED PAINT**—A newly improved paint, designed for use in plants and offices where odors from conventional paints are offensive to workers, was announced recently. Not perfumed, but actually deodorized before being canned, it is claimed that painting is made possible in any weather without discomfort. It sets in three hours, and is completely dry in 12 to 15 hours. This paint may be used on plaster, wallboard, wood, cement, brick or metal. Coverage is 700 square

feet to the gallon, it is claimed. It may be applied with a spray gun when cut with one pint of the proper thinner. All finishes are washable, and colors are designed not to fade or dull with repeated washings. American-Marietta Co., 43 East Ohio St., Chicago, Ill.

• **TRANSMISSION**—Again, woman has inspired the simplification of machine operation. The manufacturer claims the new model Western transmission for machine tools of all kinds is as easy to operate as the automobile gearshift. In addition, these transmissions remove the overhead



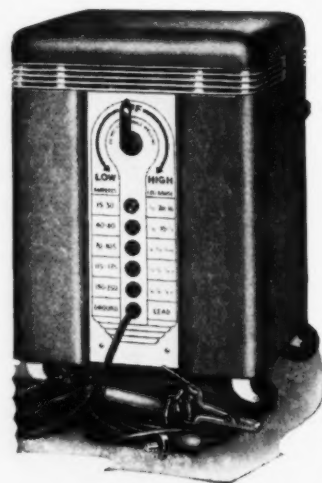
line shafting and eliminate the necessity of dangerous belt shifting by hand on Cone pulleys to make speed changes, thus avoiding most of the hazard normally found in the machine shop. Illustration shows the adaptation of a Western transmission to a milling machine. Western Manufacturing Co., 3428 Scotten Ave., Detroit, Mich.

• **ELECTRIC BRAZING**—The growing demand for silver alloy contact materials in the construction of electrical equipment has necessitated the development of new techniques for attaching these alloys to base metals parts of switch structures. An interesting illustration of the attachment of contact materials to heavy copper cast-



ings may be noted in the accompanying photograph of 4,000 ampere disconnect switch jaw and hinge to which strips and

rings of silver-nickel contact material were brazed. Eight strips were brazed to the jaw and four rings were brazed to the hinge. Each casting weighed 35 pounds. All of the contacts on each casting had to be brazed at one time; otherwise, the bonds of the contacts first brazed might be damaged by the heat required to braze the other contacts. To accomplish this, the contacts were placed on the casting and the casting held between graphite electrodes of a 50 K.V.A. Welding Machine, the outer contacts being held by these electrodes. The inner contacts also were held between graphite blocks which were pressed against the contact material by means of the wedging clamp illustrated. Very little of the current passed through this inner clamping device because it was bi-passed by the base of the copper casting itself. Most of the heat was therefore generated in the outer electrodes and the casting had to be brought up to heat slowly in order to give time for as nearly an even distribution of heat as possible so the inner contacts could be brazed before the outer contacts tended to melt. Gibson Electric Co., Pittsburgh, Penn.



• **A-C ARC WELDER**—This new welder is suitable for all types of industrial services, it is claimed, and is designed to give, in 30 different steps, practically any welding current required between 15 and 250 amperes. The low heat ranges make it possible to weld very light gauge metal without danger of burning holes, while the high heats permit the welding of heavy parts. The welder is equipped with swivel casters, making it portable and easy to handle—ready for work in any part of the shop. The welder has passed the eight-hour Burn-Out Test of the National Board of Fire Underwriters, proving the machine's ability to be used regularly at 250 amperes without transformer trouble. Allen Electric & Equipment Co., 1044 No. Pitcher St., Kalamazoo, Mich.

YOURS FOR THE ASKING

1026

• **SELECTOR CHARTS**—Anyone without technical training, easily and quickly can find the right flexible shaft coupling for his use, for light or heavy duty, the size, the bore, the exact coupling for his horse-power and r.p.m., the kind of load cushions for the conditions of operation, the price, etc., with the aid of the new L-R Selector Charts which have been made available recently to industry in general. For example, if one wished to connect driving power of 140 h.p. at 700 r.p.m. with a driven unit for greatly fluctuating loads requiring high protective resilience, the L-R Selector Chart on Type "H" shows almost instantly the coupling for this load. Lovejoy Flexible Coupling Co., 5001 West Lake St., Chicago, Ill.

1027

• **COLORFLEX**—The old-fashioned, uncertain, and often destructive method of scoring and etching floors or the bleaching and sanding of wood floors, is no longer necessary, according to the Flexrock Company. They claim Colorflex-Plus, a complete unit consisting of a cleaner and dye-like coloring, does a faster, better and more lasting job. The scientific cleaner conditions floors by removing dirt, grime and grease, neutralizes the excess alkalinity in concrete, thus enabling the dye-like coloring to form a perfect affinity with the floor. A four-page folder is available. Flexrock Company, 2301 Manning St., Philadelphia, Penn.

1028

• **HAND PUMPS**—A four-page bulletin describing hand operated, high pressure pumps for testing purposes and for operating hydraulic jacks and other small hydraulic tools was issued recently. Ten different types of pumps are illustrated, including single and double plunger types. Construction features of each are described. Pressure, plunger diameters, strokes, pipe connection diameters and code numbers are tabulated for 19 different sizes of the pumps shown, and sizes carried in stock are indicated. The Watson-Stillman Co., Roselle, New Jersey.

1029

• **MARKING DEVICE**—A new eight-page bulletin summarizing the most important styles and varieties of marking equipment and giving technical information to assist users in making most suitable selections for various classes of work was made available recently. Applications of the various types of marking devices are for both machine and hand marking. The machine devices include

roll and graduation markers for mounting in lathes and screw machines and markers for flat surfaces for use in presses, etc. A broad line of hand markers of all types is described, including those for round surfaces, shaft ends, etc. A new line of inspector's stamps also is illustrated and includes two unusual series wherein the borders form the individual identifying characteristic in addition to center numerals or letters. Approximately 100 different conventional symbol type stamp designs are shown, as well as numerous numerical and alphabetical designs and script letter styles. New Method Steel Stamps, Inc., 145 Jos. Campau, Detroit, Mich.

1030

• **SHUT-OFF VALVES**—A four-leaf folder describing a shut-off valve was released recently. The manufacturer claims that the valve automatically shuts off gas supply against fire hazard in case of such emergencies as: Damaging shock from bomb explosion or earthquake; fractured gas lines; or, any dangerously high or low gas pressure. Also included are the pressure test specifications, materials used and how constructed, and the method of operation. Security Valve Corp., 548 So. Spring St., Los Angeles, Calif.

1031

• **PORTABLE OVERPASS**—A four-page booklet describing the Tournapass has just been made available. The Tournapass is a portable, low-cost overpass, designed to eliminate traffic congestion at busy intersections. Photographs, actual time studies and car counts taken at a recent demonstration and trial period are featured in this booklet. Also, transportation, assembly and construction are explained. R. G. LeTourneau, Inc., Peoria, Illinois.

1032

• **SPRAY EQUIPMENT**—A 32-page catalog, No. 80, covering a complete line of spray equipment for both manual and automatic operation was announced recently. The introductory section of the catalog outlines the reasons for the low pressure principle under which all spray equipment operates. The booklet includes many illustrations of the equipment in operation on various types of work. Eclipse Air Brush Co., 400 Park Ave., Newark, New Jersey.

If any of this material interests you, jot down the numbers on a postal card and send to WESTERN INDUSTRY, 503 Market Street, San Francisco. We will see that full information reaches you.

1033

• **BULK HANDLING CONVEYORS**—Bulletin No. 410 explains how greater capacity can be handled with proper conveying systems. Illustrated are the types of conveyors used in different plants and for different purposes, from the glass industry to the quarry. Also shown are photographs of bucket elevators, with explanations of their uses. Chain Belt Co., 1600 W. Bruce St., Milwaukee, Wis.

1034

• **PRESTITE**—For use as a substitute for some metals high on the priority list, a porcelain material called Prestite is described in a four-page folder. According to the Westinghouse Electric & Mfg. Co., Prestite is a new and different kind of porcelain which combines all the best qualities of wet and dry process porcelain without the disadvantages of either. It can be pressure-molded into intricate shapes and readily lends itself to low cost quantity production. Mechanical strength as compared to cast metals is discussed, attention being given to pressure, temperature and distortion characteristics. Chemical and electrical properties are listed with a note on flashover effect. A tabulation of physical data compares Prestite to wet and dry process porcelain with respect to dielectric and mechanical strength, resistance to heat shock and dimensional fidelity. Booklet B-3081. Westinghouse Electric & Mfg. Co., East Pittsburgh, Penn.

1035

• **RUBBER TRACKS**—Profusely illustrated and with a large amount of data on a subject which now is becoming increasingly important, an eight-page booklet on band and block rubber tracks for vehicles has just been published. The booklet discusses the principles of both the band and block type tracks, illustrates their differences and tells their advantages over the steel crawler type of vehicle. Savings in power, decreased rolling resistance, and resistance to wear are among the subjects treated, with data tables in many instances. The B. F. Goodrich Co., Akron, Ohio.

1036

• **FASTENINGS**—A handy new guide to specifying and purchasing non-ferrous and stainless steel bolts, nuts, screws, rivets, washers and accessories has been made available. This 1942 reference book and catalog is devoted entirely to fastenings of brass, bronze, everdur, monel metal and stainless steel. It contains numerous

(Continued on page 34)

THE LAST WORD—

By the Editors

OUR dairyman has joined the miners' union and now refers to his product as *bovine ore*. He became a miner by paying dues of 10 cents per cow to district 50 and is privileged to wear a lamp on his hat. —Walter Kiernan, Portland Oregonian.



Doubletalk . . .

United Press quotes Mrs. Franklin D. Roosevelt defending the appointment of Mayris Chaney, San Francisco dancing teacher (since resigned) to a lucrative OCD post as follows: "When someone appears with a program and she is one you know, you are attacked if you approve it. But if the program comes from someone you did not know, you would be attacked because you appointed someone you know nothing about." Not being in the art-ee set, we wouldn't know.

Bundles for Congress

At San Francisco last month, prior to the self-initiated move for repeal of the pensions for congressmen, the "Bundles for Congress" satirical campaign to send useful (and useless) articles to Washington was in full sway. Barrels placed in downtown areas were quickly filled with old shoes, umbrellas, razor blades, hats and even discarded corsets. Included were diapers and a giant redwood log. The campaign was first started by the Athletic Round Table of Spokane.

Unfair Tactics

San Diego Industries, Inc., has protested to federal officials on what it terms a *plot on the part of midwestern interests to frighten Washington into moving aircraft and other war plants to inland points*. Later the Japs cooperated (with the mid-west interests) by shelling an oil refinery just north of Santa Barbara, on the California coast.

COVER PICTURE

"Harvard" type trainers awaiting shipment at the plant of North American Aviation, Inc. at Inglewood, Calif. This type of basic trainer has been very popular with the United States Army and Navy while Great Britain has used them in great quantity. Backbone of the Air Corps, thousands of these trainers must be available for training purposes to keep a steady flow of flying personnel to the armed services to man combat, reconnaissance and bombing planes. These trainers can also be used for reconnaissance work and in emergency have been used for combat.

YOURS FOR THE ASKING

(Continued from page 33)

tables of weights, chemical properties, mechanical properties and standard dimensions. It also describes numerous special fastenings which can be manufactured to order. Attractively printed in four colors, the book contains 80 pages and has a rugged, durable cover. The H. M. Harper Co., 2620 Fletcher St., Chicago, Ill.

1037

• **CONDENSATE RETURN**—A four-page bulletin covering the new Cochrane-Becker high-pressure condensate return system was announced recently. Fifty different industries are listed in which appreciable increases in production rates and excellent fuel savings are being made by the use of this unit in draining jacketed kettles, drying rolls, coil cookers, dryers, unit heaters, laundry and platen presses and similar equipment that depends on uniformly high temperatures for efficient operation. A typical installation is described in detail with a four-color illustration showing steam, condensate and makeup lines. A similar drawing illustrates the operation of the jet-loop principle on which the system operates. Detailed engineering specifications cover the technical features of design and construction. Publication 3025. Cochrane Corp., 17th Street and Allegheny Ave., Philadelphia, Penn.

1038

• **PRECISION INSTRUMENTS**—Plant operators in the process industries and also power plant engineers, as well as research men and manufacturers in general, should find much of interest in List CEC recently issued. It describes industrial models of Analyzers, Indicators and Recorders that measure with laboratory accuracy. Recording Gas Analyzers, together with pH and other equipment for making precise measurements that effect savings of time, material and labor in production, are featured in this folder. Cambridge Instrument Co., Inc., 3732 Grand Central Terminal, New York.

1039

• **ELECTRICAL CONTROL SYSTEM**—Recently issued is an 8-page booklet giving the complete story on Thy-mo-trol, the new G-E electronic control system for the operation of direct-current motors from alternating current lines. Containing photographs, a simplified chart and diagrams, the publication tells how the Thy-mo-trol system not only provides stepless, wide-range speed control, but also performs the additional functions of starting, accelerating, protecting and stopping d-c motors. Publication GED-972A. General Electric Co., One River Road, Schenectady, New York.

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1040

• **TRANSMISSION CATALOG**—According to the manufacturer, this catalog-handbook took two years to complete. It includes 52 pages of recommendations, application data, photos and engineering information. It gives a quick index source of reference for complete data on variable speed pulleys, variable speed transmissions, automatic tension control motor base, sizes, rated capacities, design and operating details, where applicable, how installed, etc. Ideal Commutator Dresser Co., Sycamore, Ill.

1041

• **STANDARD TOOLS & BLANKS**—Catalog GT-140, covering its line of standard tools with new prices effective January 1, 1942, was released recently by Carboloy Co., Inc. The eight-page bulletin covers all styles and types of tools offered, includes drawings and tables showing major specifications and tool angles, and also includes a considerable number of typical adaptations by which these standard tools can be rapidly converted to special machining requirements. Carboloy Company, Inc., Detroit, Mich.

Defense Savings Pay-Roll Allotment Plan

Now company heads can help their country, their employees, and themselves

voluntary } helps workers provide for the future
pay-roll } helps build future buying power
allotment }
plan } helps defend America today

This is no charity plea. It is a sound business proposition that vitally concerns the present and future welfare of your company, your employees, and yourself.

During the post-war period of readjustment, you may be faced with the unpleasant necessity of turning employees out into a confused and cheerless world. But you, as an employer, can do something *now* to help shape the destinies of your people. Scores of business heads have adopted the Voluntary Pay-roll Allotment Plan as a simple and easy way for every worker in the land to start a *systematic and continuous* Defense Bond savings program.

Many benefits . . . present and future. It is more than a sensible step toward reducing the ranks of the post-war needy. It will help spread financial participation in National Defense among all of America's wage earners.

The widespread use of this plan will materially retard inflation. It will "store" part of our pyramiding national income that would otherwise be spent as fast as it's earned, increasing the demand for our diminishing supply of consumer goods.

And don't overlook the immediate benefit . . . money for defense materials, quickly, continuously, *willingly*.

Let's do it the American way! America's talent for working out emergency problems, democratically, is being tested today. As always, we will work it out, without pressure or coercion . . . in that old American way; each businessman strengthening his *own* house; not waiting for his neighbor to do it. That custom has, throughout history, enabled America to get things done *of its own free will*.

In emergencies, America doesn't do things "hit-or-miss." We would get there eventually if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this Voluntary Savings Plan.

Like most efficient systems, it is amazingly simple. All you have to do is offer your employees the convenience of having a fixed sum allotted, from each pay envelope, to the purchase of Defense Bonds. The employer holds these funds in a separate bank account, and delivers a Bond to the employee each time his allotments accumulate to a sufficient amount.

Each employee who chooses to start this savings plan decides for himself the denomination of the Bonds to be purchased and the amount to be allotted from his wages each pay day.

How big does a company have to be? From three employees on up. Size has nothing to do with it. It works equally well in stores, schools, publishing houses, factories, or banks. This whole idea of pay-roll allotment has been evolved by businessmen in cooperation with the Treasury Department. Each organization adopts its own simple, efficient application of the idea in accordance with the needs of its own set-up.

No chore at all. The system is so simple that A. T. & T. uses exactly the same easy card system that is being used by hundreds of companies having fewer than 25 employees! It is simple enough to be handled by a check-mark on a card each pay day.

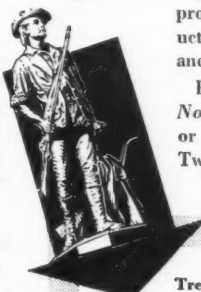
Plenty of help available. Although this is *your* plan when you put it into effect, the Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to have experienced men work with you just as much as you want them to, and no more.

Truly, about all you have to do is to indicate your willingness to get your organization started. We will supply most of the necessary material, and no end of help.

The first step is to take a closer look. Sending in the coupon in no way obligates you to install the Plan. It will simply give you a chance to scrutinize the available material and see what other companies are already doing. It will bring you samples of literature explaining the benefits to employees and describing the various denominations of Defense Savings Bonds that can be purchased through the Plan.

Sending the coupon does nothing more than signify that you are anxious to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable all wage earners to participate in financing Defense; *something* to provide tomorrow's buying power for your products; *something* to get money *right now* for guns and tanks and planes and ships.

France left it to "hit-or-miss" . . . and *missed*. Now is the time for *you* to act! Mail the coupon or write Treasury Department, Section A, 709 Twelfth St. NW., Washington, D. C.



FREE - NO OBLIGATION

Treasury Department, Section A,
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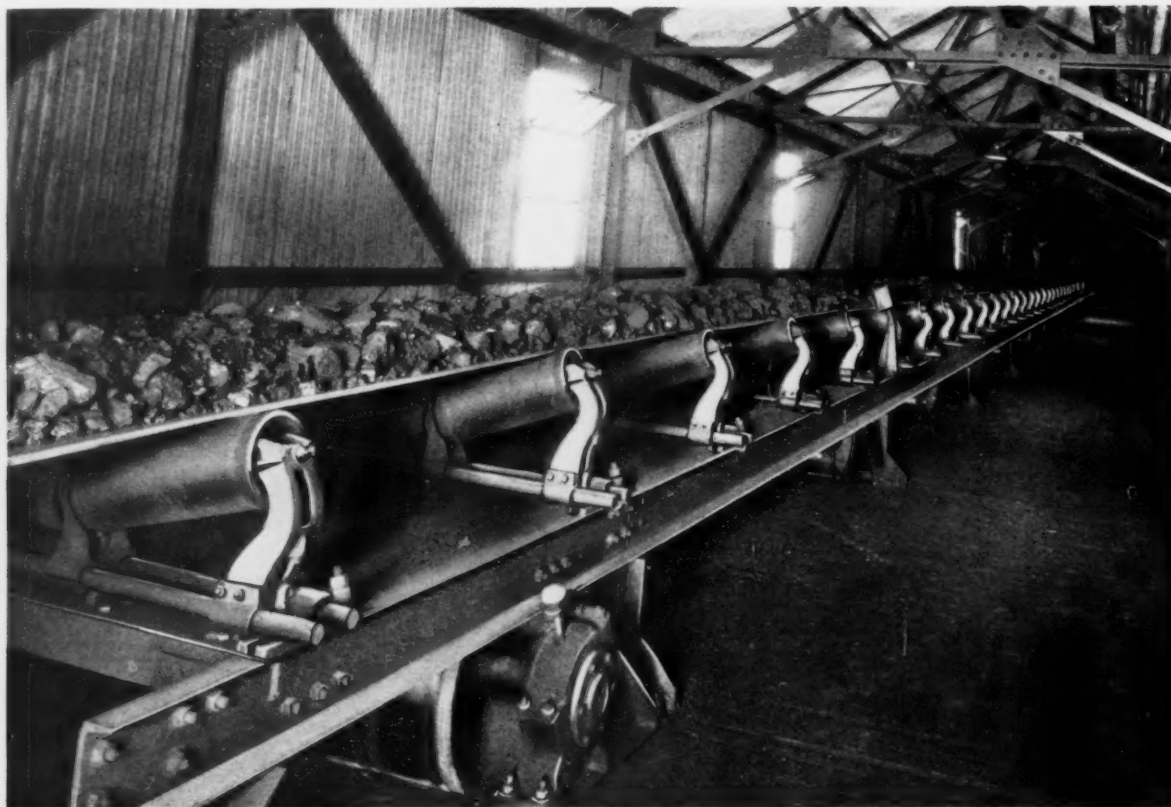
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